TECHNOLOGY REVIEW

February 1959

technology
review
Published by MIT

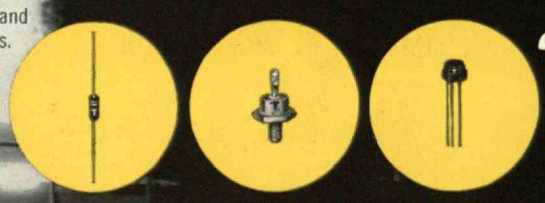
wherever there's electronics...

there's Transitron

Advanced electronics is helping to open new frontiers in space. Vital to the reliability of rockets are their electronic guidance systems which depend on the tiny semiconductor. Maker of the industry's broadest line of advanced silicon and germanium semiconductors is Transitron. In rockets, missiles, industrial computers, long-distance communications, radar, atomic subs, jets — *wherever there's electronics* — there's Transitron, known the world over for leadership in semiconductors.

U. S. moon-shoot vehicles depend on Transitron products in their instrumentation and guidance systems.

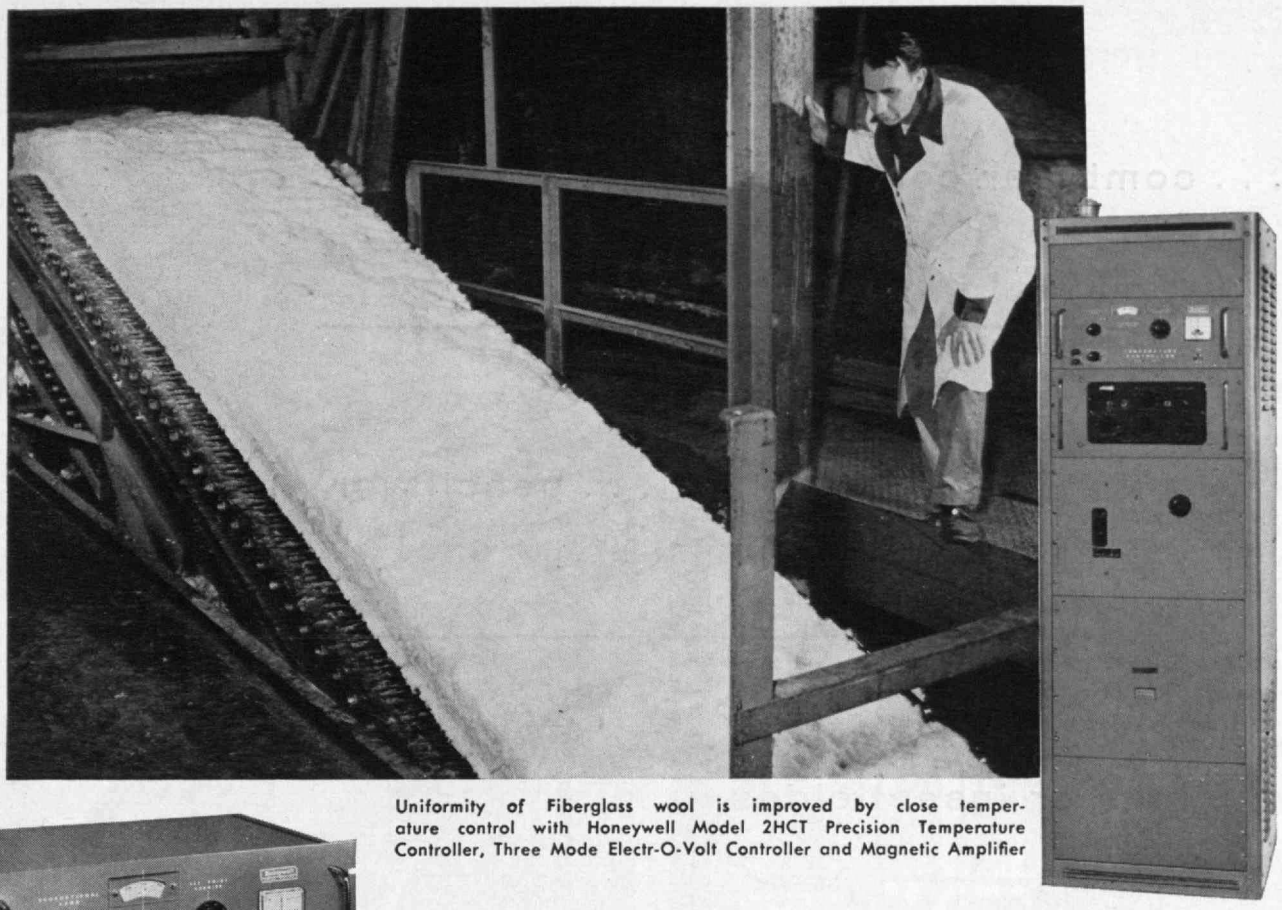
TRANSISTORS · RECTIFIERS · DIODES · REGULATORS · VOLTAGE REFERENCES



Transitron

electronic corporation • wakefield, massachusetts

SALES OFFICES IN PRINCIPAL CITIES THROUGHOUT THE U. S. A. • CABLE ADDRESS: TRELCO



Uniformity of Fiberglass wool is improved by close temperature control with Honeywell Model 2HCT Precision Temperature Controller, Three Mode Electr-O-Volt Controller and Magnetic Amplifier

Model 2HCT-2, single range control unit with direct reading analog dial, is available in a wide variety of ranges for any millivoltage or thermocouple input.

Temperature Control within 0.05% with new Honeywell Temperature Controller

The new Honeywell Precision Temperature Controller, series 2HCT, operates magnetic amplifiers and similar devices for control of saturable core reactor furnaces whose temperature can be measured with thermocouples.

The 2HCT consists of a null balance input circuit with manually adjusted set points and a highly stable d-c amplifier. The difference between the thermocouple signal and the set point is amplified 100,000 times to operate control circuits. Proportional band adjustment permits a decrease of sensitivity by a factor of 10.

There are 2 standard models: The 2HCT-2, which is shown above at left, and the 2HCT-3, which is designed for noble metal couples, covering temperatures from 0 to 3,000°F in 3 steps. Setting to ½ part in 3,000 is accomplished with a direct reading digital dial.

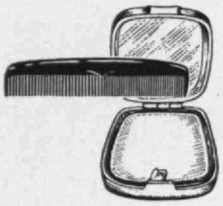
For applications requiring reset and derivative control functions, the 2HCT is used with a Honeywell Three Mode Electr-O-Volt Controller. Write for 2HCT Specification Sheet to Minneapolis-Honeywell, Dept. 1, Boston Division, 40 Life Street, Boston, Mass.

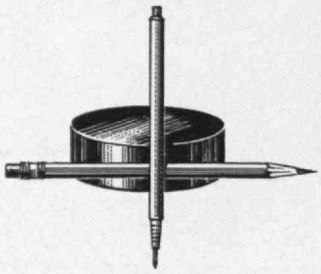
- No moving parts . . . magnetic converter input
- No stray electrical pickup . . . 60 cycle rejection of greater than 6×10^9
- Continuous automatic standardization
- Sensitive to change of less than 1 μv
- Full output power for 12 μv input deviation from set point
- Three-mode control available using Honeywell Electr-O-Volt

Honeywell

H HONEYWELL First in Control

. . . combs or cosmetics





. . . pencils or pucks

. . . inks or insecticides

Better Products begin with CABOT!

Cabot raw materials for industry — still increasing and constantly being improved by continuing Cabot research — have been putting a plus into other people's products for 75 years.

Better rubber and plastics products . . . better paints and pharmaceuticals . . . better inks and insecticides . . . the list of products made better by Cabot raw materials is long — and still growing.

It costs you nothing to find out whether or not Cabot can help you with your raw material problems — and it may well result in a product that performs better, lasts longer, earns more profit. It's happened before with hundreds of manufacturers who have proved to themselves that better products begin with Cabot.

CABOT®

WHICH OF THESE CABOT MATERIALS CAN HELP YOUR PRODUCT?

CABOT CARBON BLACKS . . . *more than 45 different grades of channel, furnace and thermal blacks for use by the rubber, printing ink, paint, varnish, lacquer, enamel, plastics, paper, phonograph record, battery and other industries.*

WOLLASTONITE . . . *as a paint pigment, this white, uniform calcium metasilicate, has more desirable properties than other extenders used singly or in combination. Excellent for ALL types of paint, and for the quality improvement of wall tile and semi-vitreous ceramics.*

CAB-O-SIL® . . . *this unique colloidal silica, in extremely small quantities, greatly improves large numbers of products. The best flow control agent available, it's especially remarkable for its unusual combination of properties. Used for rubber, paint, varnish, printing ink, plastics, lubricants, cosmetics, many other products.*

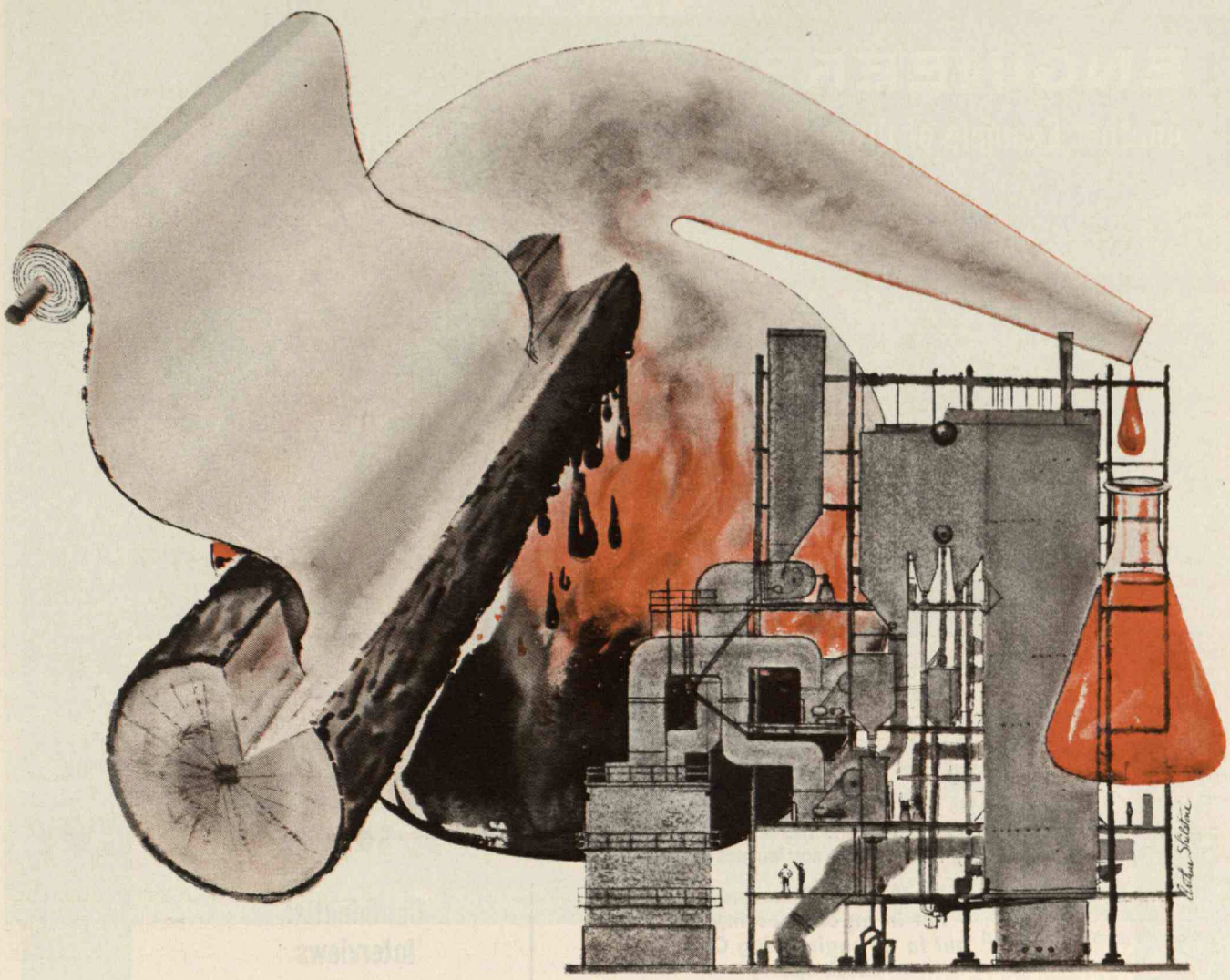
PT®PINE TAR PRODUCTS . . . *these versatile quality controlled materials improve the performance of a wide variety of products, including: rubber, paint, cordage, oakum and insecticides.*

For complete information, phone or write:

GODFREY L. CABOT, INC.

77 FRANKLIN ST., BOSTON 10, MASSACHUSETTS

Phone: Liberty 2-7300



World's largest chemical recovery unit achieves unprecedented economies in the pulp and paper industry

Chemical recovery is basic to the multi-billion-dollar pulp-and-paper industry. Valuable chemicals are salvaged from "black liquor," a residue of pulp manufacture. And the modern recovery process also produces large quantities of by-product steam.

Just a few years ago, the industry believed that recovery units had reached maximum size, with capacities (black liquor dry solids) of about 1,000,000 pounds per day. C-E engineers, aware that larger installations would mean lower investment and operating costs per unit of capacity, developed half a dozen major innovations in quick succession—and broke through the size barrier.

Twenty-five units of more than 1,000,000-pounds capacity have since been purchased from C-E by leading producers. The largest of these—a 2,000,000-pound unit—has now been in service for more than a year. Despite their high initial costs, such units usually pay for themselves in about two years.

This concern with a specific industry's capital problems—and deep involvement with that industry's technology—is characteristic of the C-E approach.

"CREATIVE ENGINEERING" is the foundation on which Combustion's leadership rests. The products which bear the C-E mark of leadership include:

all types of steam generating, fuel burning and related equipment • nuclear power systems • paper mill equipment • pulverizers • flash drying systems • pressure vessels • soil pipe

COMBUSTION ENGINEERING

Combustion Engineering Building, 200 Madison Avenue, New York 16, N. Y.

C-193

. . . a hand in things to come

Unlocking the secrets of the universe

Amazing textile fibers spun out of natural gas . . . wonder drugs squeezed from coal . . . shining stainless steel forged from drab, brownish earth. These man-made marvels were born in the minds and hands of research scientists.

Never satisfied with things as they are, the research scientist takes apart the raw materials of nature to capture the basic "building blocks" of the universe. Then he rearranges and combines the pieces into new and better things that help improve our lives.

Research is a living thing to the people of Union Carbide—for it is the foundation upon which their work is built. They have created hundreds of useful products from such basic substances as oil, natural gas, ores, air, and water. And the wonders yet to come, the completely new things of tomorrow, are being sought and found in Union Carbide's laboratories today.

Learn about the exciting work going on now in alloys, carbons, chemicals, gases, plastics, and nuclear energy. Write for "Products and Processes" Booklet A, Union Carbide Corporation, 30 East 42nd St., New York 17, N.Y. In Canada, Union Carbide Canada Limited, Toronto.

UNION CARBIDE

...a hand in things to come

THE TABULAR VIEW

Thorough Endorsement. — According to gossip that reached the "land of the bean and the cod," New Mexico's Regional Conference was everywhere given the nod. Selected because of its interest, in every conceivable way, is the paper entitled "The Challenge," delivered by JAMES W. MCRAE. It tells of achievements of science, and progress that should make man soar. But it notes with an air of discouragement that these are used mainly for war. "The Challenge" proposes that science — and man's engineering feats, too — be turned into purposes peaceful, and that they make warfare taboo.

Dr. McRae, author of "The Challenge" (page 191) is a native of Vancouver and received the B.S. degree in electrical engineering from the University of British Columbia in 1933. He received the M.S. degree a year later and the Ph.D. degree in 1937, both from California Institute of Technology. His engineering and administrative work has been entirely in the field of electrical communications and, except for military service as an officer during World War II, he has been affiliated with the Bell System. Early in 1942, he accepted a commission as Major in the U.S. Army Signal Corps and was assigned to the Chief Signal Officer in Washington. Two years later, he became chief of the Engineering Staff at the Signal Corps Engineering Laboratories at Bradley Beach, N.J., and attained the rank of Colonel before returning to civilian life. As a member of the technical staff of the Bell Telephone Laboratories, he was engaged in research on transoceanic and microwave communication and gradually turned to administrative work. In 1949 he became director of Transmission Development, and in 1951 was elected vice-president of Bell Telephone Laboratories. He became vice-president of Western Electric Company, and president of Sandia Corporation in 1953, and vice-president of the American Telephone and Telegraph Company in 1958. He has been active, and has held numerous important posts, in the Institute of Radio Engineers.

Helpful Nudge. — Tuition, transportation, and living costs are steadily rising, and college enrollment increases faster than new facilities can be built to accommodate students. Strangely enough, while students are competing with one another to get into college, the institutions of higher learning compete with one another for students. In contrast with past years, today's students make application to several colleges and frequently their final selection is based with an eye to economic factors. The status of present college admissions problems is outlined (page 195) by B. ALDEN THRESHER, '20, Professor of Economics and also Director of Admissions at M.I.T. Professor Thresher received the S.B. degree from M.I.T. in 1920 and the M.A. degree from Harvard University in 1928. From 1920 to 1925, he was assistant plant manager of the Eddystone Manufacturing Company, and from 1925 to 1927 was on the staff of the research

(Concluded on page 176)

If you need condenser and heat exchanger tubes for critical service...

Specify **Phelps Dodge**... a major supplier for nuclear projects!

Phelps Dodge condenser and heat exchanger tubes are currently in use in nuclear energy applications where highest quality and exacting specifications are essential.

Every Phelps Dodge tube intended for use in a nuclear project undergoes a series of severe tests to assure rigid conformance to the required specifications and ability to perform under the rigorous service conditions found in this highly specialized field. Testing facilities used by Phelps Dodge cover not only standard ASTM specifications but also include these special non-destructive tests:

- Eddy-current inspection
- Dye penetrant test
- Ultrasonic inspection

To keep pace with the steadily growing importance of the nuclear power field, Phelps Dodge will soon open one of the largest tube mills in the world at South Brunswick, N. J. This mill will have the most modern automatic tube fabricating machinery, the finest research laboratories and the most advanced testing equipment.

Inquiries regarding your condenser and heat exchanger tube needs, particularly those requiring Electronic and Penetrant Tests, are invited.

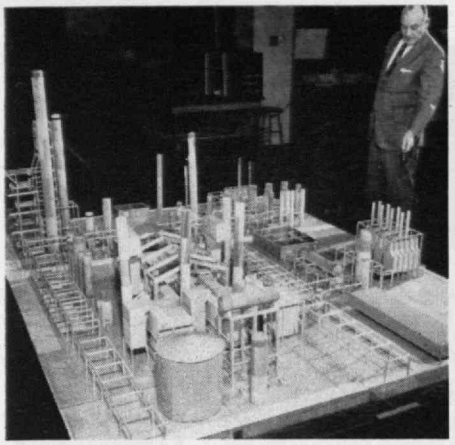
PHELPS DODGE COPPER PRODUCTS
CORPORATION
300 PARK AVENUE, NEW YORK 22, N. Y.

PD

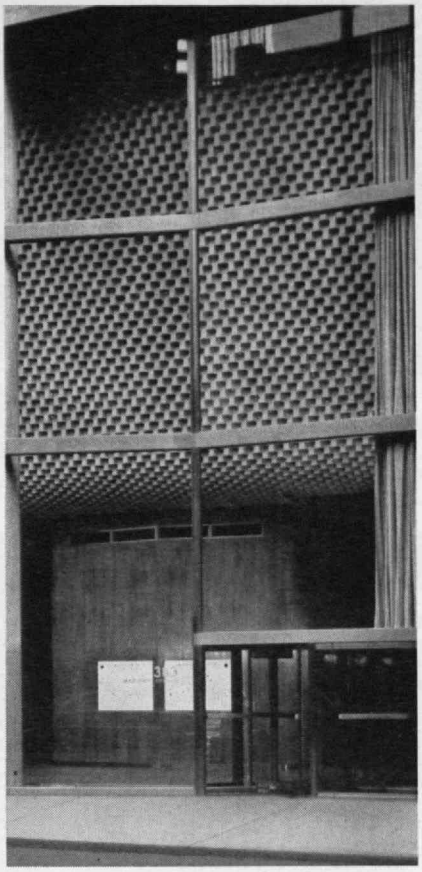
division of the Dennison Manufacturing Company. He returned to M.I.T. in 1929 as an instructor in economics, was appointed assistant professor in 1932, and associate professor in 1935. In 1945 he was made professor of economics. He became Director of Admissions in 1936, and still holds that important Institute post. He is currently chairman of the College Entrance Examination Board.

Everyone's Dentist. — Once an object of frightening apprehension, the dentist chair has lost much of its former terror. In fact, such remarkable progress has been achieved in dental techniques, and so many new materials and improved methods have been introduced that everyone is encouraged to visit his dentist periodically. Such visits are all the more necessary for, by and large, as is recorded on page 199, the teeth of American citizens are in somewhat poor repair. The author of "A Tooth for a Tooth" is FREDERIC W. NORDSIEK, '31, Editorial Associate of The Review since 1944, and well known to Review readers from more than 100 feature articles and unsigned Trend of Affairs items which have appeared in The Review consistently in the past 15 years. A native of New York, Mr. Nordsiek received the S.B. degree in Biology and Public Health from M.I.T. in 1931. He has had wide experience in research and administration in the food industry and in public health. From 1943 to 1951, he was assistant director, Research Service Department of Standard Brands, Inc. Since 1951, he has been associated with the American Cancer Society, where his present work deals with administering research grants and programs. Currently, Mr. Nordsiek is supplementing an already busy schedule with graduate studies in New York. He is a prolific and accurate writer and his articles on technical and nontechnical subjects have appeared in many publications.

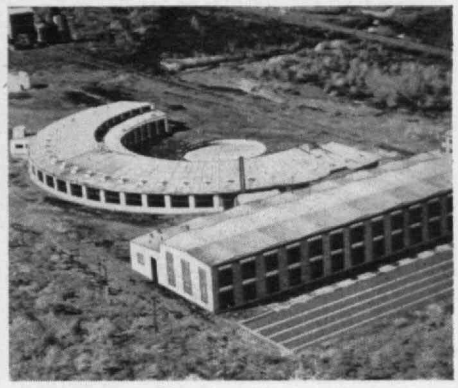
One of a series of advertisements on Lummus' world-wide facilities.



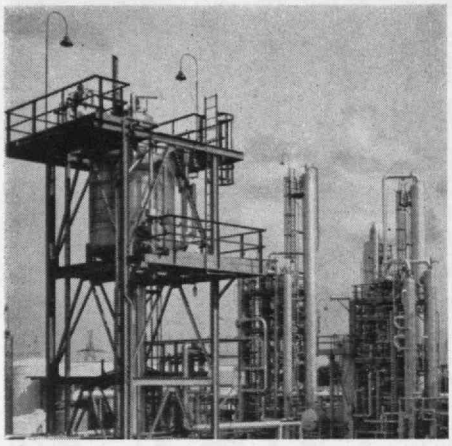
200,000,000 lb. per year ethylene plant



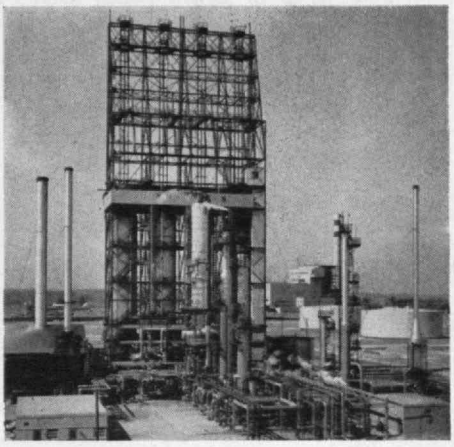
The Lummus Company headquarters
385 Madison Avenue, New York, N. Y.



Beryllium plant



High pressure acetylene chemicals plant



600 ton per day coking unit

Lummus New York is headquarters for design, engineering and construction

Engineers and Constructors of More Than 700 Refineries, Chemical and Petrochemical Plants of all Types and Sizes Throughout the World in the Last 50 years.

The Lummus Company headquarters are at the business crossroads of the world in New York, ready to coordinate the engineering skills of over 3,000 permanent employees located in seven branch offices and subsidiaries throughout the world.

A staff of more than 1,000 scientists, engineers and administrators contributes a wealth of skill and experience – each in his chosen field – to handle the great mass of detail involved in a modern processing plant. Few single companies in the process industries can afford to maintain the reserve of industrial experience and engineering skill that characterizes the Lummus organization.

In addition, Lummus maintains a 150,000 square foot Engineering Development Center in Newark, N. J., to bridge the practical gap between laboratory research findings and commercial plant operation. The Center has extensive pilot plant facilities in operation, and is equipped for designing and building new units.

Several recent domestic projects of The Lummus Company (pictured above) are: a 200,000,000 lb. per year ethylene plant; America's first full scale, high-pressure acetylene chemicals plant; a beryllium metal plant; and a 600 ton per day coking unit designed for the heaviest charge ever fed to a coker.

See Lummus on your next project.

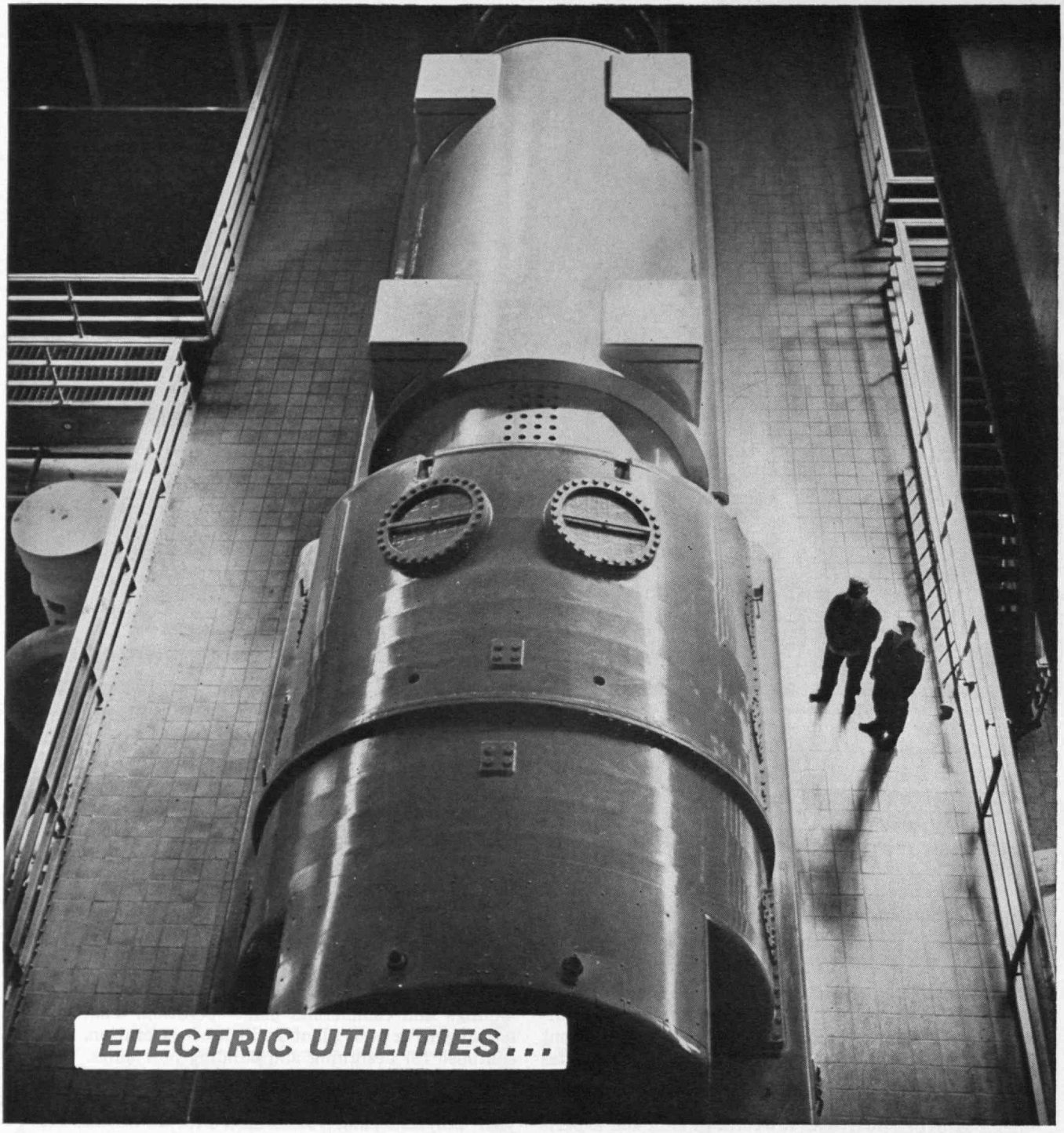
Branch offices of The Lummus Company are located at Washington, D. C. and Houston, Texas.

Subsidiaries are in Montreal, Maracaibo, London, Paris, The Hague.

LUMMUS

Visit the Lummus Exhibit, Fifth World Petroleum Congress Exposition,
New York Coliseum, June 1-5, 1959

ENGINEERS AND CONSTRUCTORS FOR INDUSTRY
385 MADISON AVENUE, NEW YORK 17, N.Y.



Where the Engineer Designs His Own Career

Here's an industry that started big after the war . . . surged ahead in every direction . . . keeps on growing today when others are tapering off . . . and still has its biggest years ahead. The electric utilities business is basically an engineering business. Many of its top executives come from engineering ranks; from systems planning, design, operations, research, or sales; and with backgrounds ranging from electronics and nucleonics to older branches of scientific learning. If you want a career in an *expanding* industry that is based on engineering look to our electric public utilities. We know you'll like working with them. We have been doing it for many years in supplying this great industry with Kerite quality insulated wire and cable. See your placement officer, or write us at 30 Church Street, New York 7, N. Y.

KERITE CABLE

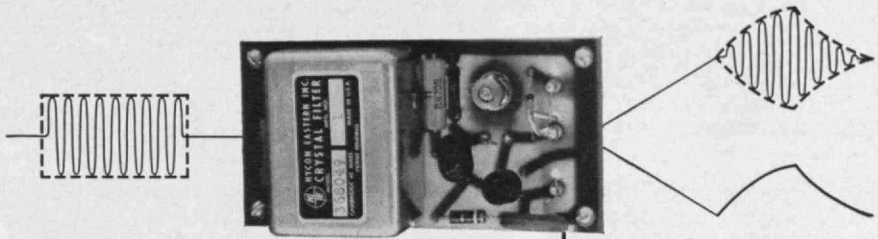
it's the **KERITE** *that makes the difference*

DEDICATED TO PROGRESS
P R I
MEMBER

FIRST 1,040 Mile

Pulse Doppler Radar uses

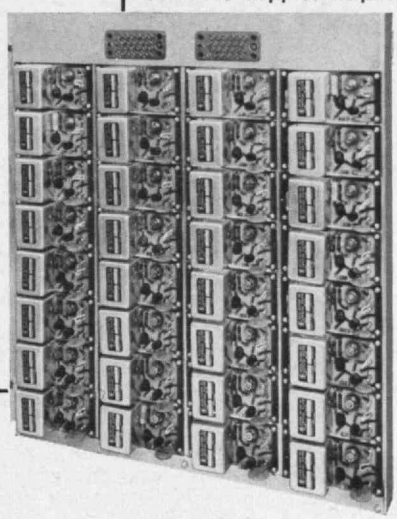
HYCON EASTERN CRYSTAL FILTERS



Hycon Eastern Selective Doppler Amplifier . . . shown ½ size

Millstone Hill 84′ Radar Antenna

Section of Doppler Receiver showing banks of Hycon Eastern Selective Doppler Amplifiers



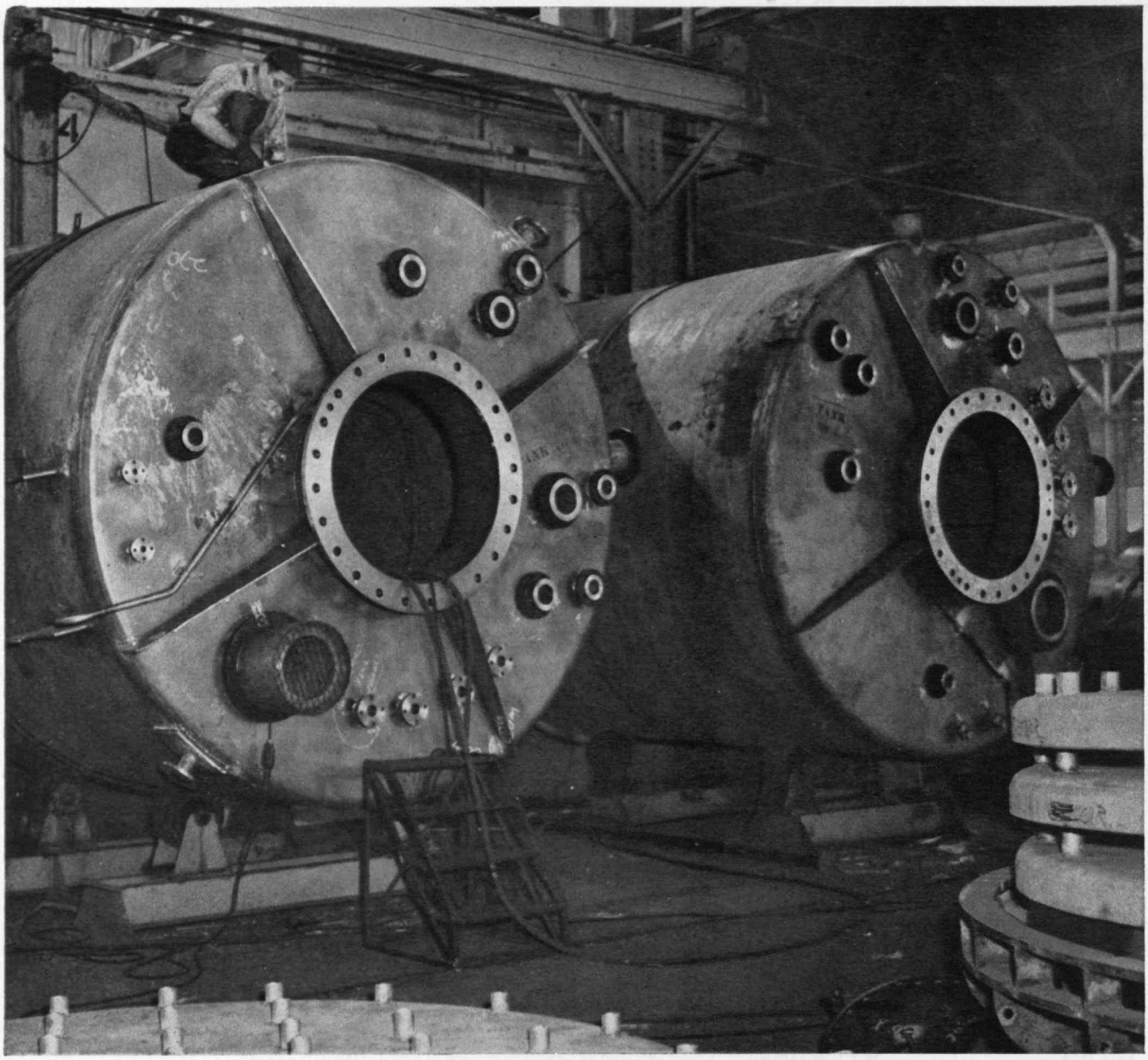
The problems in long range radar for today's ballistic missile defense systems require solutions that are unique yet reliable. Meeting these criteria is the Lincoln Laboratory's "Millstone Hill System". Working closely with Lincoln Laboratory on the transient response problems, Hycon Eastern provided "comb set" crystal filters and associated circuitry forming complete networks termed Selective Doppler Amplifiers.

Hycon Eastern offers a unique customer service by assuming total responsibility for exact pulse output. All crystal filters are tested and aligned under simulated operating conditions, using a pulsed input. Transistor amplification, active impedance transformation, and detector circuitry are provided for complete compatibility with the total system. These integrated units are delivered ready for immediate use.

Hycon Eastern is presently supplying crystal filter banks for airborne intercept, bomber defense, shipborne and land based detection and tracking systems. Write for Crystal Filter Bulletin.

HYCON EASTERN, INC.

75 Cambridge Parkway Dept. H Cambridge 42, Mass.



For Transferring Radioactive Process Wastes

. . . DESIGNED IN STAINLESS

Ever since work on atomic reactors began, Graver has been building stainless tanks for transferring radioactive process effluents. Filled by remote control and cooled to remove heat from radioactive decay, tanks of the design shown above have been in service long enough to now be regarded as a standard for this use.

Stainless is useful for its ability to withstand either basic or acidic liquid wastes for a long time without serious corrosion. For mixed radioactive wastes with many "half-lives", such tanks may be required to hold dangerous isotopes for a very long time. The craftsmanship must be of the highest, which is never a question with Graver's hundred-year reputation for quality fabrication. For atomic energy use or for industrial wastes, stainless and alloy fabrication by Graver provides the complete answer for long-lived installations.

Plants and Offices Across America

GRAVER®

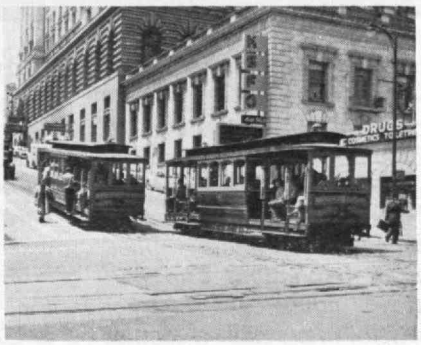
GRAVER TANK & MFG. CO.
DIVISION—UNION TANK CAR COMPANY
EAST CHICAGO, IND.

THE TECHNOLOGY REVIEW

EDITED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

CONTENTS for FEBRUARY, 1959, Vol. 61, No. 4

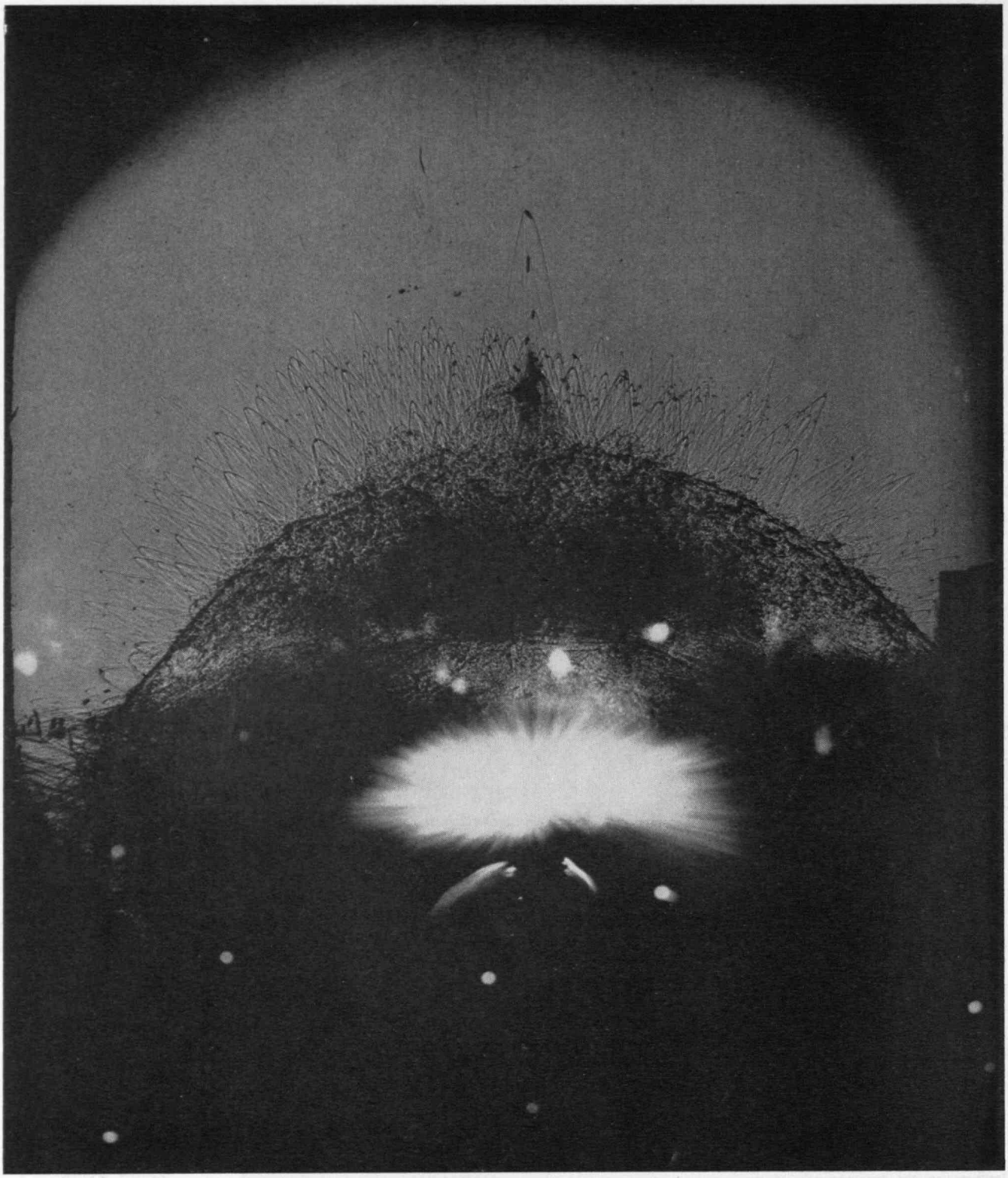
Published monthly from November to July inclusive on the twenty-seventh of the month preceding the date of issue, at 60 cents a copy. Annual subscription, $4.00; Canadian and foreign subscription, $4.50. Published for the Alumni Association of the M.I.T.; John J. Wilson, President; H. E. Lobdell, Executive Vice-president; D. Reid Weedon, Jr., William W. Garth, Jr., Vice-presidents; Donald P. Severance, Secretary-Treasurer. Published at Hildreth Press, Inc., Bristol, Conn. Editorial Office, Room 1-281, Massachusetts Institute of Technology, Cambridge 39, Mass. Entered as second-class mail matter at the Post Office at Bristol, Conn. Three weeks must be allowed to effect change of address, for which both old and new addresses should be given.



Uphill Going!

The world renowned and warmly cherished cable cars of San Francisco retain their popularity, as passenger rail service generally declines.

Photograph by Ward Allan Howe



Dynamic Burst

This halftone reproduction is an interesting example of the limits to which photographic techniques can be pushed to aid man's study of nature. It shows the ejection of high-speed particles coming from the end of a No. 6 Du Pont dynamite cap photographed about 35 microseconds after detonation. The particles have average velocities of about 6,000 feet per second, although a few particles may reach velocities of about 10,000 feet per second. White spots are caused by impact of fragments from the dynamite cap case striking a plate of safety glass.

Images of particles traveling at such high speeds would be completely blurred unless the exposure time were of very short duration. In the example shown here, exposure time was about one ten-millionth of a second.

This illustration was produced by Harold E. Edgerton, '27, Professor of Electrical Measurements, who is internationally known for his work in developing illuminants, shutters, cameras, and related apparatus for increasing the effectiveness of photography as an analytical tool and important implement of science.

The Technology Review

VOL. 61, NO. 4 FEBRUARY, 1959

The Trend of Affairs

Aeronautics and Astronautics

■ Astronautics has officially become a part of the curriculum at the Institute. The name of the Department of Aeronautical Engineering has been changed to Department of Aeronautics and Astronautics, C. Richard Soderberg, '20, Dean of the School of Engineering, announced recently. Charles S. Draper, '26, will continue to head the Department, which is regarded as one of the most outstanding in the world. Regarding the change, Dr. Draper said:

In recent years, as the potentialities of rockets and other spacecraft have become plainer, the Department has been increasingly concerned with space.

The airplane is here to stay for a long time, and we will continue to regard aeronautics as fundamental. But the sky, or speaking more precisely, the air, is no longer the limit. Interplanetary travel is yet to be accomplished but clearly it will be feasible.

M.I.T. must educate men who are prepared not only to design and build the craft that we conceive of today but to engineer new types of flight vehicles which at this time we can only imagine.

The problems of aerodynamics, structures, propulsion and control associated with aeronautics and astronautics differ in detail but are so much alike in basic principles that aeronautical engineering and astronautical engineering form a single field. This field surely contains some of the greatest challenges to science and engineering that now confront the human race. For those individuals who are motivated by these challenges and have the talents and fortitude for a rigorous education, aeronautics and astronautics have much to offer.

To meet current needs, aeronautical and astronautical engineering must deal with the problems of flight vehicles ranging from helicopters, vertical take-off convertiplanes, short take-off and landing craft, subsonic aircraft, supersonic aircraft and guided missiles moving within the atmosphere, to ballistic missiles, satellites, lunar vehicles, and interplanetary craft.

Education in science and applied science to provide the background required for this range of vehicles must be thorough in all fundamentals and carefully planned so as to be effective.

M.I.T. pioneered in aeronautics and in recent years has also pioneered in astronautics. As early as 1896, a wind tunnel was built at the Institute for the study of wind pressures. It produced winds of 20 miles an hour. The hypersonic wind tunnel of the Naval Supersonic Laboratory now at M.I.T. is capable of airflows at Mach 8 (about 3,100 miles per hour at 2,000 degrees).

Various studies in aeronautics were made, and students experimented with gliders in the early years after the Wright Brothers made their first flight. Lectures were presented from time to time and in 1913 the first formal Course in Aeronautical Engineering was offered at the Institute – perhaps the first in the United States.

Jerome C. Hunsaker, '12, who graduated from Annapolis (No. 1 in his class) and came to M.I.T. in 1909 as a graduate student in naval architecture, decided to make aeronautics a career. After receiving a master's degree in 1912, he was sent by the Navy to Europe to learn what was being done in aeronautics there and, upon returning to M.I.T., gave the new graduate Course in Aeronautical Engineering. He directed the construction of a wind tunnel in 1914, one of the first large ones in the United States.

Meanwhile he continued as a graduate student, and in 1916 was awarded a doctor's degree for his work in the field of aeronautics, the first such degree at M.I.T.

Dr. Hunsaker returned to the Navy during World War I as chief of the newly constituted Aircraft Division of the Bureau of Construction and Repair. He designed the "NC" airplanes, one of which in 1919 made the first transatlantic flight, and designed the *Shenandoah,* the first zeppelin-type airship to use helium.

The first four-year undergraduate Course in Aeronautical Engineering at M.I.T. was started in 1926 by the late Edward P. Warner, '17. In 1932 Dr. Hunsaker returned to M.I.T. to take charge of it as well as the Department of Mechanical Engineering. Dr. Hunsaker served as the head of the Department of Aeronautical Engineering until 1951, when he was succeeded by Dr. Draper. An emeritus professor, Dr. Hunsaker is still active in the Department.

Dr. Draper had received a master's degree in Aeronautical Engineering in 1928 and began teaching the following year. Although his interest in aeronautics has been broad, his special field has been instrumentation. He is regarded as the American father of inertial guidance, the system which makes it possible to navigate rockets, space vehicles, and submarines without use of radio or magnetic compass.

Dr. Draper's conception of the use of gyroscopes in inertial guidance and gunsights dates to the early 1930's. He is director of the M.I.T. Instrumentation Laboratory, in which a staff of 900 work on these problems. Among other accomplishments, the laboratory has developed the inertial guidance system for *Polaris*, the Navy ballistic missile designed for launching from submarines.

One of the earliest courses in inertial guidance was given at M.I.T. Astronautical subjects were first presented 10 years ago, and sponsored research in many fields has served to keep teaching at the very frontier of this rapidly developing field concerned with long-range rockets and space vehicles.

The Department has been especially noted for research and teaching in such subjects as aeroelasticity, aircraft structures, stability, control, and automatic flight control. More than 50 subjects are now offered to students in the Department. These include not only advanced techniques now in use but also the principles of those likely to play a part in the astronautics of the future, such as nuclear power and ion propulsion.

Alumni of M.I.T. have been prominent in many branches of aeronautics. These include two who are now members of the M.I.T. Corporation – Donald W. Douglas, '14, and James H. Doolittle, '24.

Individuals Noteworthy

■ Important in early 1959 news were the 20 promotions, elections, or appointments presented below:

Alfred P. Sloan, Jr., '95, as a member of the National Council of the National Planning Association . . . *Clayton D. Grover, '22,* as Chief Officer, Whitehead Metals, Inc. . . . *John W. Beretta, '23,* as Chairman of the Texas State Board of Registration for Professional Engineers, and as a member, Board of Governors, Southwest Research Institute;

Harold C. Pearson, '23, as President, Construction Chemicals, Ltd., Ontario distributor for Dewey and Almy Chemical Division, W. R. Grace and Company of Canada, Ltd. . . . *William E. P. Doelger, '26,* as a trustee, Manhattan Savings Bank . . . *James R. Killian, Jr., '26,* as Chairman, Federal Council for Science and Technology, new government committee created to establish long-range policy for government support of scientific research and development;

Arthur R. Elliott, '28, as Vice-president and General Manager, Greater Winnipeg Gas Company, Manitoba . . . *Walter F. H. Mattlage, '28,* as General Manager, Fabrics and Finishes Department, E. I. du Pont de Nemours and Company, Inc. . . . *Edward M. Tittmann, '29,* as Vice-president and Director, American Smelting and Refining Company;

James B. Fisk, '31, as President, Bell Telephone Laboratories . . . *Daniel D. Strohmeier, '34,* and *William R. Hewlett, '36,* as trustees, respectively, of Webb Institute of Naval Architecture and of Mills College;

Adolph L. Antonio, '37, as Vice-president, Chemical Division, Aerojet-General Corporation – a subsidiary of General Tire and Rubber Company . . . *W. Gardner Barker, '37,* as President and Chief Executive Officer, Thomas J. Lipton, Inc. . . . *Jerry McAfee, '40,* as Vice-president of American Institute of Chemical Engineers for 1959;

Albert H. Bowker, '41, as Dean, Graduate Division, Stanford University . . . *Rogers B. Finch, '41,* as Associate Dean, School of Science, Rensselaer Polytechnic Institute . . . *Stanley N. Golembe, '42,* as President, Power Sources, Inc., Burlington, Mass.;

David K. Hardin, '49, as Executive Vice-president, Market Facts, Inc., Chicago . . . *Renato N. Nicola, '53,* as President, Newton Company, Manchester, Conn.

■ Special honors recently awarded or announced to six Alumni include:

To *Harold S. Osborne, '08,* a special award "in appreciation of leadership," by the Engineers Joint Council . . . to *Thomas D'A. Brophy, '16,* Silver Stein Award "for outstanding service not only to M.I.T. and the Club but to charitable and civic affairs," by the M.I.T. Club of New York . . . to *Otto E. Kirchner, '24,* an award for "distinguished service in achieving safer utilization of aircraft," by the Flight Safety Foundation . . .

To *Thomas A. Knowles, '27,* a certificate of achievement "for significant contributions to the Army Missile Program," by the Army Ordnance Missile Command . . . to *Donald G. Fink, '33,* a technological award for "outstanding contribution by a scientist in industry toward improving technological training standards," by the New York Institute of Technology . . . to *Arthur B. Metzner, '51,* the 1958 Junior Award, by the American Institute of Chemical Engineers, for a paper (written with *George L. Houghton* and *Robert D. Vaughn*) entitled "For Heat Transfer in Non-Newtonian Fluids."

Hand in Hand

■ Co-operative engineering education in the United States, in which the vast facilities of American industry were linked with the best of college education to produce engineers with practical, as well as theoretical training, had its beginning in the United States around 1908. The half-century mark of this happy union of education and industry has been marked by the publication of *Hand in Hand,** the first book to tell what this revolutionary co-operative movement can mean to high school students interested in science and engineering, to their parents, and to industry.

The 340-page book is dedicated to William H. Timbie, Professor of Electrical Engineering and Industrial Practice, Emeritus, who for many years was in charge of the M.I.T. Co-operative Course in Electrical Engineering.

The volume has been produced by a distinguished committee of engineers and educators. Alfred L. Dowden, '31, served as editor-and-chairman, and Eugene W. Boehne, '28, Professor of Electrical Engineering, as adviser. Professor Boehne succeeded Professor Timbie, and is administrator of the M.I.T. Co-operative Course in Electrical Engineering.

Biographical sketches and portrait illustrations of graduates from Course VI-A are a major part of this unusual volume.

* Medford, Mass.: Gordon and Company, 1958.

James L. Tryon: 1864–1958

■ James L. Tryon, Professor Emeritus of International Law and former Director of Admissions for M.I.T., died at the Lawrence Memorial Hospital on December 22. Dr. Tryon served the Institute for 17 years before his retirement in 1936, and will be remembered by the hundreds of students to whom he was an adviser and friend.

Born in Boston in 1864, Dr. Tryon worked on Portland, Maine, newspapers during his youth. He was graduated from Harvard College in 1894 and then received a degree of bachelor of divinity from the Episcopal Theological School of Massachusetts. After serving for 10 years as rector of the All Saints' Church in Attleboro, and of the Church of St. John the Evangelist in Mansfield, he turned to law, attended Boston University, and received the degrees of bachelor of laws in 1909 and doctor of philosophy in 1910.

A dedicated worker for world peace, Dr. Tryon held a secretarial position with the New England branch of the American Peace Society and was director of the Massachusetts and Maine Peace Societies. He attended international peace congresses in Munich, London, Geneva, The Hague, and Constance, Germany, before World War I, and lectured on peace in many American and Canadian churches and universities. Following the war he lectured on international law at the Episcopal Theological School in Cambridge and the University of Maine before coming to M.I.T. in 1920 as an instructor in history. He became director of admissions in 1930. He was a member of the Maine bar, the American Society of International Law, the International Law Association, the American Society for Engineering Education, the Field and Forest Club, and the Masons.

Dr. Tryon is survived by: a son, Richard W. Tryon of Springfield, N.J.; a daughter, Miss Sylvia Tryon of Medford; a sister, Dr. Geneva Tryon of Cape Elizabeth, Maine; three grandchildren; and three great grandchildren. His wife, Mrs. Katherine Allen Tryon, a pioneer lecturer on ornithology and an accomplished artist, died in 1952.

Sophomore Wins Model Car Competition

■ An 18-year-old native of Philadelphia, Pa., now a student at M.I.T., has won honors in the nationwide model car competition which was conducted by Fisher Body Craftsman's Guild.

Thomas L. DeFazio, '61, who lives at 2731 South 12th Street, Philadelphia, won the senior division first place state award for Pennsylvania in the 1958 competition. He also won the top regional honors for Pennsylvania and Maryland, and received an expense-free trip to the Craftsman's Guild four-day national convention recently held in Detroit. Mr. DeFazio is enrolled in the Department of Mechanical Engineering in the School of Engineering at M.I.T.

The M.I.T. sophomore, a campus dormitory resident, received a trophy in recognition of his work from John T. Rule, '21, Dean of Students. The trophy was donated by the Fisher Bodies Division of General Motors Corporation. The program is designed to interest young men in creative designing and craftsmanship.

On the Horizon

March 12-14, 1959 – 11th Annual Fiesta, M.I.T. Club of Mexico, Mexico City, D.F. (For reservations, consult Clarence M. Cornish, '24, Margaritas 257, Villa Obregon, Mexico 20, D.F., Mexico.)

June 15, 1959 – 25th Alumni Day, 1959. M.I.T. Campus in Cambridge.

Grant to Study Africa

■ Africa, which is rapidly taking a position of prime importance in world affairs, will be the subject of an intensive three-year research project at the Institute's Center for International Studies, according to a recent announcement by Julius A. Stratton, '23, President of M.I.T.

The study will be financed by a $200,000 grant from the Carnegie Corporation, made to M.I.T. The project will be directed by Arnold Rivkin, former associate general counsel of the U. S. International Co-operation Administration, who has visited Africa several times. It will be under the general direction of Max F. Millikan, who has been director of the M.I.T. Center for International Studies since its establishment in 1952. Dr. Millikan is professor of economics in the Department of Economics and Social Science.

Research will be focused on the rapid political and economic development of the area of Africa south of the Sahara Desert, with the exception of the Union of South Africa. Teams of economists and political scientists will be sent to the area, concentrating on studies of Nigeria, French West Africa, the Belgian Congo, and the Federation of Rhodesia and Nyasaland.

Professor Wolfgang F. Stolper has taken a leave of absence from the University of Michigan to work on the project. Gordon Unsworth, head of the Africa Unit of the United Nations Bureau of Economic Affairs, and Mrs. Ona B. Forrest, an economist for the bureau, are co-operating in the study. Miss Elizabeth Davis, statistician, is included as a member of the project staff.

"The vast areas which we will study are largely underdeveloped regions with new societies evolving," Mr. Rivkin said. "They have many problems, much potential, and, as yet, little cohesion. They have aspirations for developing a higher standard of living, and this study, by adding knowledge and insights, could make a contribution to such developments."

Questions around which research will center are ones such as: What kind of political framework will best facilitate the rapid economic development and at the same time provide for participation of the individual in decision-making? How can peaceful evolution of the new states in Africa be achieved in the context of changing colonial relationships?

Problems in external trade and intra-Africa trade, commodity price fluctuations, capital formation, private investment, and other economic fields will be considered, with emphasis on economic development and political change.

Taking part in presentation ceremonies during which the Institute acquired an original manuscript by Sir Isaac Newton are (in usual reading order): Azel W. Mack,'15; Sidney M. Edelstein,'32, who presented the Newton manuscript; John E. Burchard, '23, Dean of the School of Humanities and Social Studies; William N. Locke, Director of M.I.T. Libraries; and Giorgio D. de Santillana, Professor of the History of Philosophy and Science. Dr. Edelstein, donor of the gift, is president, and Mr. Mack is Vice-president of the Dexter Chemical Corporation. A reproduction of the last page of the manuscript is shown in the halftone below.

M.I.T. Gets Newton Manuscript

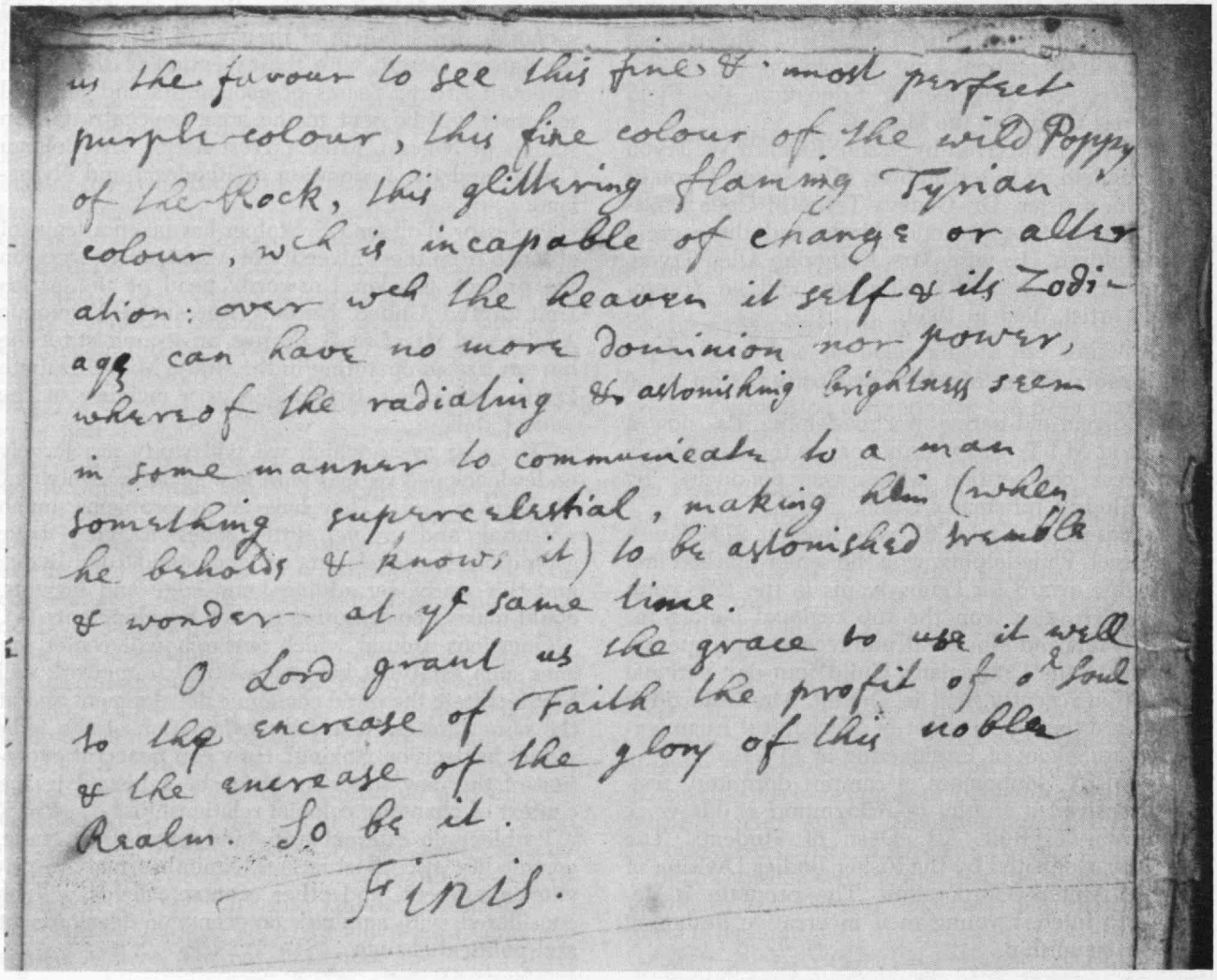
■ An original manuscript by Sir Isaac Newton, great Seventeenth Century scientist, was presented to the Institute by Sidney M. Edelstein, '32, of New York. It will be used in studies of the history of science and technology.

The manuscript is a 61-page, 15,000-word English commentary and translation of a book on alchemy by Nicholas Flamel, Fourteenth Century Frenchman who claimed to have succeeded in doing what alchemists tried to do for hundreds of years – to make gold and silver out of cheaper metals (mercury in this case).

Dr. Edelstein, who is president of the Dexter Chemical Corporation, has been interested, ever since he was a student at M.I.T., in the history of alchemy – long ago discredited but nevertheless important since modern chemistry grew out of it. He has been collecting early books and manuscripts on alchemy and chemistry for 20 years. Dr. Edelstein is a member of the Advisory Board of the American Chemical Society.

William N. Locke, Director of Libraries at M.I.T., who received the gift, said, "We are very happy to have the manuscript, since we have no other original work by Newton in our small collection and it should prove of great value to scholars working in this field."

M.I.T. Photos


us the favour to see this fine & most perfect
purple-colour, this fine colour of the wild Poppy
of the Rock, this glittering flaming Tyrian
colour, wch is incapable of change or alter
ation: over wch the Heaven it self & its Zodi-
ack can have no more dominion nor power,
wherein the radiating & astonishing brightness seem
in some manner to communicate to a man
something supercelestial, making him (when
he beholds & knows it) to be astonished trouble
& wonder- at ye same time.
O Lord grant us the grace to use it well
to the encrease of Faith the profit of o^r Soul
& the encrease of the glory of this noble
Realm. So be it.
Finis.

Although there are other translations of Flamel's book, the one by Newton, which has never been published, should prove of special interest because it doubtless reflects Newton's views of science in the Seventeenth Century, Dr. Locke said. Newton was one of the greatest scientists of all time, he pointed out, and many of his conclusions regarding physical laws are as correct today as they were 300 years ago.

Chemistry was in its infancy in Newton's time, however, and he gave serious consideration to the ancient alchemists' superstitions, though he is believed to have been less interested in making gold in the laboratory than he was in determining the unifying chemical laws, just as he unified physical laws through his explanation of gravitation.

Flamel's work was based on an ancient manuscript written on bark by a Jewish scholar, which he succeeded in deciphering after many years of work. This manuscript gave directions for the preparation of the "philosopher's stone," the chemical compound which alchemists believed would change lead into gold, cure diseases, and accomplish other magical effects.

"It is ironical," Dr. Locke said, "that today science has learned how to transmute one metal into another by atomic processes. The goal of the alchemist has been attained, but now there are far more important things for humanity than to make gold. Modern science has made it possible to cure diseases which alchemy didn't even know existed."

Technological Factors in America's Growth

■ Americans' pride in their technological achievements has exceeded their understanding of how they came about, John B. Rae, Associate Professor of History at M.I.T., told historians at the meeting of the American Association for the Advancement of Science held in Washington, D.C., on December 30.

Addressing the newly organized Society for the History of Technology, he said that knowledge of technological aspects of our history has been too fragmentary to enable us to understand fully the evolution of American civilization. A more thorough and accurate understanding of how science and technology have influenced, and been influenced by, the American environment, Dr. Rae argued, would be an eminently desirable step toward an intelligent appreciation of what they may hold for us now.

When the United States was an undeveloped country, he pointed out, there was no "fairy godmother distributing largesse in the form of economic aid or technical assistance." The folk heroes of American technology, consequently, are "the Edisons and Fords, men with a minimum of formal training, dedicated to cut-and-try, and lacking in scientific background and inclined to be scornful of scientific method.

"One consequence," he continued, "was that to the end of the Nineteenth Century the relationship between science and technology was somewhat casual." This attitude has been modified now, but "the emphasis on the practical still dominates American thinking.

"While we can concede that we have unduly neglected 'pure' or 'basic' research in the past and now need to give it more vigorous encouragement," Professor Rae reminded the historians, "it does not follow that the American emphasis on the practical has been wrong. The technique of application may, in itself, be more significantly creative than the original idea or invention."

Citing examples from the aluminum, petroleum, and automobile industries of the importance of technological change in industrial growth, he called for more intensive study of the interrelationships of technology and industry.

"Technological change may, and frequently does, originate in an isolated act of genius, but its effectiveness in an economic sense is a matter of time and circumstances," Professor Rae explained. "We must give more attention to the role of technology in the growth and organization of industry.

"Our failure to do so in the past has resulted in misconceptions and distortions, particularly in the area of big business. The predominant attitude is still suspicious of bigness. We seldom inquire into the possible relationship between the growth and structure of the business and the technological processes in which it was engaged.

"Unless adequate weight is given to the technological factor, it is completely impossible to give an accurate picture of the growth and character of American business enterprise," Dr. Rae concluded.

Nonlinear Random Theory

■ Appropriately enough, Norbert Wiener, M.I.T. Professor of Mathematics, appears as author of the first volume in the Technology Press Research Monographs. Dr. Wiener's newly published *Nonlinear Problems in Random Theory* is the book inaugurating this series, and his third to be issued under the joint imprints of John Wiley and Sons, Inc. of New York, and the Technology Press of M.I.T.

In line with the suggestions of Yuk-Wing Lee, '27, Associate Professor of Electrical Engineering, and Amar G. Bose, '51, Assistant Professor of Electrical Engineering, at M.I.T., and receiving their enthusiastic co-operation, Dr. Wiener undertook to expound on his ideas in a series of lectures given to a selected group of graduate students earlier this year. Dr. Lee, sitting in with his camera, caught in black and white the intricate formulae written in otherwise expendable chalk. A busy tape recorder meantime committed the lectures to durable form and the entire proceedings, translated into print, make up the present book.

Dr. Wiener's work is of wide interest to mathematicians, electrical engineers, atomic physicists, biophysicists, and those in all branches of statistical mechanics. As the author demonstrates, random processes — in space as well as time — enter into the study of statistical mechanics, and open new paths into the study of gas and plasma theory. His methods, though utilizing complex mathematics, are applicable to such practical problems as electric power in homes, television sets and FM radio, and washing machines.

Nonlinear Problems in Random Theory further reflects Professor Wiener's absorption in the mathematical analysis of brain waves. In this connection, he perceives a mathematical similarity between the orbits of the asteroids and the behavior of the oscillators in the brain, and observes other fine shadings that elude even the keenest eye.

Biological Tissue Hardened

■ Imitating what is believed to be nature's way of making bones and teeth, materials taken from soft biological tissue have been hardened in a test tube. Recent achievements in hardening reconstituted biological material in the laboratory were reported at a meeting of the American Association for the Advancement of Science, in Washington, during its 125th annual conclave on December 30, by Melvin J. Glimcher, '57, biophysicist and orthopedic surgeon who is now a fellow in the School for Advanced Studies at M.I.T.

Dr. Glimcher compared the processes, by which soft tissues in the body are hardened to create a skeleton, to ways in which chemists have strengthened a great variety of materials for the builders of machines. Long threads consisting of groups of atoms linked together – which the biologists call macromolecules – are found in both the soft and the hard parts of animal bodies. In the bones, shells, and other hard parts of animals, these macromolecules have been so aligned and woven together that they resist stresses and provide protection for other parts of the body, give it form, and make locomotion possible.

In the bones and other hard parts of the body, moreover, these threadlike macromolecules contain hard crystals which make them less flexible than the chemically similar threads found in the flesh and skin. According to Dr. Glimcher, these crystals are formed the way that ice is made from water when clouds are seeded. Crystals of the ice arise most readily around minute particles of foreign matter having a configuration which makes it easy for the molecules of the water to solidify around them.

In the M.I.T. laboratories, threads of macromolecules taken from soft biological tissue have been hardened in a test tube by deposition of crystals within them. These bits of man-made, bonelike material are too small to be seen. Under an electron microscope, however, they resemble the material in the bones of living things, and the hardness of the synthesized biological material has been established by electron and x-ray diffraction studies of it.

By examining the molecular construction of the macromolecules and that of the chemical solutions in which crystallization occurs, and those in which it fails to occur, a better understanding of the way in which the material in a bone is hardened has been acquired.

Work such as Dr. Glimcher and his colleagues are now doing could lead eventually to new methods of promoting the reunion of broken bones, the treatment of bone ailments, and also such diseases as arteriosclerosis, which result from abnormal hardening of biological tissue in parts of the body where normally soft tissue is required for health.

Dr. Glimcher turned to biophysics after preparing for a career in orthopedic surgery, and has been working for the last few years under the direction of Professor Francis O. Schmitt, Professor of Biology, M.I.T.'s distinguished authority on collagen.

Twenty-five Years Ago This Month . . .

■ On February 17, 1934, at Walker Memorial there took place the 58th Annual Alumni Dinner, with 850 present – a record attendance except for the 45th Dinner at Walker on January 10, 1920, when 1,070 had foregathered to hear the mysterious "Mr. Smith" revealed as George Eastman.

According to The Review, the 58th Dinner "was also one of the most enthusiastic. Classes not only competed for attendance (1926 won with 43) but for decibel delivery (1914 taking the honors). The Institute's first class, 1868, had the highest percentage of its membership present (one out of two), with Robert H. Richards occupying his usual coign of vantage.

"Redfield Proctor, '02, President of the Alumni Association, presided at the dinner and he presented as speakers Dr. Frank Aydelotte, President of Swarthmore College, Dr. Compton, President of the Institute, Dr. Bush, '16, Vice-President and Dean of Engineering, and Dr. H. E. Edgerton, '27. President Aydelotte, who once taught English and history at the Institute, spoke out of his considerable experience with engineering education and strongly recommended a more cultured, well-rounded education of the engineer. With undesigned appropriateness, President Compton spoke of the Institute's efforts to prepare men not only to be engineers, scientists, and architects, but to be useful, happy citizens as well.

"At the beginning of his address, Dr. Compton paid tribute to the late Everett Morss, '85, for many years Treasurer of the Institute and a member of the Executive Committee of the Corporation and for two terms President of the Alumni Association. Dr. Compton made public for the first time the story of the Blashfield murals which adorn the walls of the great hall in which the dinner was held.*

"Mr. and Mrs. Everett Morss had taken so much pleasure in the Blashfield murals in their own home that they conceived the idea of bringing similar pleasure to the thousands of Technology students who use the great hall of the Walker Memorial for dining and social functions. Mr. Morss, therefore, wrote to Mr. Blashfield to find out under what terms he would paint the proposed murals. Blashfield, himself an M.I.T. alumnus, Class of 1869, replied that he had always wanted to do something for the Institute and that he would, therefore, be glad to donate his services, provided the actual cost of materials and labor of assistants could be taken care of. This expense, which ran into many thousands of dollars, was quietly taken care of by Mr. Morss himself.

"Thus these splendid murals," Dr. Compton continued, "which are distinctively the creation and gift to the Institute of Mr. Blashfield, should be at the same time an added reminder to Technology of the thoughtful, energetic, and varied contributions to its welfare made by Everett Morss."

* Mr. Morss was the 14th President of the Alumni Association, serving in that office for the calendar years 1906 and 1907. In 1908 he became a member of the Institute's Corporation, and in 1910 of its Executive Committee. From 1921 until his death on December 27, 1933, he was Treasurer of the Institute.

To Study Lost Wax Molding

■ New techniques to take the place of 5,000-year-old methods of casting art objects in metal are to be sought at the Institute. A $10,000 grant has been made by the Rockefeller Foundation to support research by Alfred Duca, Boston sculptor, in the M.I.T. foundry laboratory.

According to Professor Howard F. Taylor, 2-46, who announced that Mr. Duca had joined the staff of the Department of Metallurgy as a research associate, the research will concentrate on the simplification and improvement of the "lost wax" process of molding sculpture, first used in Egypt and China thousands of years ago.

The traditional lost wax method is used principally to make hollow castings, Professor Taylor explained. A plaster model is made of the desired object. This model, or armature, is then coated with wax, which is sculptured and covered with plaster. Heat is used to harden the plaster mold and to melt the wax, which runs off, or is "lost." Molten metal is then poured into the mold, taking the place of the wax. When the metal has hardened, the mold is removed.

"The lost wax process, and for that matter, practically all casting of sculpture, is nearly a lost art in America," Professor Taylor said. "Young men have found that they can earn more money working on mass-production assembly lines than as apprentices or artisans in art casting, with the result that it is difficult to find a foundry in the United States to cast a work of art at a reasonable price.

"The consequence is that most casting of fine sculpture must be done in Europe. An American sculptor who has done his work in clay or wax must send it to Italy, Portugal, or France, where art casting is still a highly regarded craft. It is generally desirable that he oversee the work himself. Going to Europe, or even sending sculpture there for casting, is expensive and time-consuming. This is one reason that sculpture has languished in the United States.

"Mr. Duca has been doing some preliminary research in new methods and we believe that with the help of metallurgists he can apply new technology to a very old art in ways that will help American sculptors."

Mr. Duca will work under the general supervision of Professor Taylor and Merton C. Flemings, '51, Assistant Professor of Metallurgy. They are in charge of the foundry laboratory, which in recent years has been a center for the development of new techniques for industrial foundry work. Professor Taylor holds the professorship of foundry metallurgy which was established by the American Brake Shoe Company.

A graduate of Pratt Institute and the Boston Museum School, Mr. Duca has executed hundreds of paintings, prints, and sculptures, using a wide range of materials, and his work has been exhibited in many galleries in the United States and Europe. He is the inventor of a process for the use of polymer tempera, a plastic, in painting and sculpture. Four years ago he began independent research in metal casting, and earlier this year presented his first one-man show of bronzes (most of which he had cast himself) at the Boris Mirski Gallery in Boston. He has lectured at M.I.T. and Boston University.

M.I.T. Photo

Frederic H. Fairchild, Colonel, U.S. Air Force (left), assigned to M.I.T. where he is head of the Department of Air Science, pays a call on J. A. Stratton, '23, President. Colonel Fairchild has been appointed as professor of air science at the Institute. He is a graduate of the U.S. Military Academy at West Point, and attended the Air War College and Industrial College of the Armed Forces. Previously, he served as inspector at the Missile Test Center, Patrick Air Force Base, Fla.

Computer Studies of Traffic

■ Using a high-speed computer to simulate the flow of automobiles and trucks through tunnels, over bridges, and on single-lane roadways, a research group at the Institute is studying traffic patterns with a goal of nailing down the parts played by individual drivers and vehicles in heavy traffic.

The Institute's Operations Research Center is conducting the study with the help of the Port of New York Authority. Current work is focused on such places as the Holland and Lincoln Tunnels and the George Washington Bridge, but the research is applicable to conditions at heavy traffic areas around the country. The study is being conducted by Herbert P. Galliher, Jr., Assistant Director of the Center, who is responsible for the study, and Walter S. Helly, 28-year-old physics graduate student at the Center, who is research assistant in the Department of Physics. They are using the I.B.M. 704 Computer at M.I.T.'s Computation Center to simulate certain traffic conditions and study them.

"In addition to being a problem of intense personal concern to us all," said Dr. Galliher, "traffic flow invites the use of computers, mathematics, and psychology to analyze the causes of bottlenecks. As everyone knows, traffic problems are not simple." The versatile computer at M.I.T. actually generates a picture of traffic situations, simulating the position of each car at intervals of a quarter of a second, and drawing lines between the points, so that delays and varying distances between vehicles can easily be seen.

The essential task, the researchers explained, is to build into the simulation the proper characteristics of individual drivers. The Port of New York Authority has been assisting in a program to determine

these characteristics. A special camera, mounted high in the New York tower of the George Washington Bridge, automatically recorded 90 times each minute the positions of cars crossing the bridge. When traffic speeded up or slowed down, an "accordion" effect was produced in the line of following traffic which will be analyzed to determine driver reactions to a continually changing traffic situation. Information obtained from the pictures is being reduced to data that will be fed into the computer, and this will simulate traffic conditions that will keep Mr. Helly busy for some time.

The immediate goal of the studies being conducted by Mr. Helly is greater knowledge of the nature of congested traffic flow, and measurement of factors that control it. For example, how much would a given flow be speeded up if stop and brake lights were placed so as to allow drivers to see them many cars ahead? How much do trucks slow down the over-all flow? How much and how safely would compulsory minimum speed limits improve flow? How much does high horsepower contribute in permitting quick closing of traffic gaps by fast acceleration? How much additional flow would it be worth if driver reaction times could be speeded up? How much additional flow would result from giving drivers more information—even signs with general advice as well as warnings of specific hazards or intersections ahead?

"The simulation is an inexpensive way to answer these questions," explained Mr. Helly, "and as the Port of New York Authority emphasizes, even small increases in current flow are very valuable to the persons waiting for passage during heavy traffic periods."

The American Style

■ Do Americans have their own characteristic ways of solving problems?

"Yes, but those ways are changing," is an answer to this question given in a new book, *The American Style*, which is the product of a conference held by the M.I.T. Center for International Studies.

The conference brought together 30 of the intellectual leaders of the United States, last year, for four days of discussion at Endicott House, which is the M.I.T. guest house in Dedham, Mass. Participating were such people as: J. Robert Oppenheimer and George F. Kennan of the Institute for Advanced Study in Princeton; Dean McGeorge Bundy and David Riesman of Harvard University; Alfred H. Barr, Jr., Director of the Museum of Modern Art; and Wiliam S. White, political columnist. James R. Killian, Jr., '26, and Julius A. Stratton, '23, at the time, President and Acting President, respectively, were among the M.I.T. representatives. Max F. Millikan, Director of the Center for International Studies, was chairman.

The central theme of the conference was analyzed by Walt W. Rostow, Professor of History at M.I.T., in an essay which appears in the book under the title "The National Style." Compromise and practical experimentation have been two of the principal American methods of dealing with problems, he asserted.

"Both the adjustment to conflicting regional and group interests within our national society and the process of social mobility have been enormously aided by the sustained growth and high output per head which has marked the history of modern American economy," Dr. Rostow wrote. "This not only gave reality to the concept of progress but also permitted men to achieve compromises in which they shared the increments to communal wealth without the bitter, corrosive conflicts which come about when men feel they can rise only at the expense of someone else's decline."

Citing various chapters in American history, Dr. Rostow expressed the opinion that decisions are likely to be made on the basis of "experience, feel, judgment, by sensing recurrent patterns" instead of by "clean-cut logical connections of cause and effect." He observed:

This is how good captains of sailing vessels have worked – good politicians, good businessmen. This has been the typical American style in operating and developing the nation's society. Its success, however, is dependent on two conditions which are, to a degree, alternatives. First, the problems confronted must be, in their essence, relatively familiar and capable of solution by only moderately radical innovation on the basis of existing principles or institutions.

Second, there must be sufficient time for the experimental exploration of possible solutions and the osmotic process of accepting change. The more time permitted, the greater the workability of a technique of problem solving by empirical experiment. . . . The American style is least effective when it confronts issues which require radical innovation promptly. . . .

On domestic matters the classic style still operates. And over a wide range of issues, it operates with a heightened effectiveness. The two major parties continue to work as intermediate instruments of compromise and reconciliation on a continental basis. . . .

In foreign policy a different aspect of the national style gives us chronic difficulty – the relative ease and continuity of our political and social experience. We had to fight for independence, but from early colonial days the basic presuppositions of American life were those of an individualist society. We never had to struggle to free ourselves from a feudal society and political past. . . .

Thus, we face a world where something like a billion and a half human beings are caught up in one version or another of an effort to break old, static molds and to modernize their societies; we can find little instinctive in our history or in our political or economic processes which fully meets their case. . . .

From our wartime relationship with the Chinese Nationalists down to the Middle East crisis and the foreign aid bill debate, we have had difficulty in understanding the complex processes at work in the underdeveloped areas and in harmonizing our efforts with those of the men and women caught up in the great nationalist revolutions now going forward in strategically decisive areas of the world.

We have, to our cost, been excessively culture-bound in facing this mammoth fact of the Twentieth Century.

It will take more reflection and imagination – more application of the vicarious rather than instinctive knowledge – than we have thus far brought to bear on national policy to protect the national interest as these revolutions evolve over the coming decades . . .

Other essays in the book were written by Dr. Oppenheimer and Mr. Kennan; Abraham Kaplan of the

(Concluded on page 214)

The Challenge

We need science and technology to maintain our military muscles, to feed the world's people, and to conserve its resources. But we also need both to wage effective peace

by JAMES W. McRAE

In talking about the challenge of the future, it may be well to begin by going back 1,000 years to the now extinct civilization of the Mayan people who lived in Yucatan, Mexico. It is surely fair to say that the jungle has not been very kind to the monuments those people left. They are now badly crumbled and no one is sure what caused the Mayans to abandon them so suddenly. The generally accepted opinion seems to be that the problem was a social one; that the ruling classes, who were theocrats, drifted away from the people. Indeed, it seems that the rulers shifted the basis of their religion from its old preoccupation, with the problem of securing good crops, to one which emphasized war and warriors. This change did not appeal to the population which was essentially agricultural. Finally, it is believed that, at a propitious time, the populace rose up and killed off its ruling class. The Mayans then were left without a creative minority and reverted to a primitive culture.

Such reversions to a primitive culture have happened many times the world over in the course of history. So we may well ask, what is likely to happen to our culture? If we were to ask that question of Khrushchev he would answer it promptly. He does not see a very long future for us. He thinks we will give up the heritage of Western civilization in favor of Soviet-style Communism, and if we don't do so voluntarily, the Communists will see that we do, or that we are buried properly. This is a real and immediate threat to our culture and one we have to face realistically. It brings us face to face with the military challenge.

Before we go further into military problems, we have to remind ourselves that there are two requirements for any culture. One is to maintain the right amount and kind of military strength. By this is meant not necessarily the military strength to handle only one threat, but the strength to handle a whole range of possible threats. The second requirement is to avoid focusing too much attention on military matters. We must not overlook long-range problems which peaceful existence imposes. Indeed, we must avoid the mistakes made by the Mayans in their failure to attend to other aspects of their culture besides war and warriors. This is another part of our challenge.

In this regional meeting, our attention is to be devoted primarily to science and technology, and particular emphasis is to be placed on peaceful applications of science. This is as it should be. But before we shift to our major topic, we should recognize the military challenge facing us. At the moment, a good deal of our applied science and technology is devoted to meeting this military challenge, and residents of New Mexico are keenly aware of the importance of scientific contributions to warfare. After all, this is the state in which the nuclear weapon was born and nuclear weapons have dominated questions of military strength ever since 1945.

All of us remember the history of nuclear weapons. The bombing of Hiroshima and Nagasaki almost certainly saved many American lives, but immediately after these explosions there was a popular revulsion against atomic weapons. As time went on, revulsion was replaced by hope; hope that nuclear weapons, under international control, would be the means for eliminating large-scale warfare. However, the Russians would have no part of such a plan and we were left to build up a one-sided deterrent to military aggression in the form of our stockpile of nuclear weapons. By now this has changed, and today we no longer have a one-sided deterrent. The Russians have their own stockpile, and now Russia and the Western world look at each other across two military stockpiles of nuclear weapons – theirs and ours.

To its big bombs and big bombers, Russia is also adding a family of very big missiles. One of these could carry a big nuclear war head all the way from

Bell Telephone Laboratories

Control desk of NIKE electro-mechanical simulator represents an example of the use to which science and technology have been put to maintain strong national defenses.

As we go forward with industrialization . . . inevitably the rate of use of the world's natural raw materials will again be increased by large factors, inevitably some natural resources must be expected to become depleted. For example, our supply of iron cannot last forever.

Neither, for that matter, can our supply of copper on which the electronics and electrical industries depend so heavily. But by applying the best and latest knowledge of science and technology, as is done in this copper pit in Morenci, Ariz., it is possible to use raw materials more efficiently and to engage in effective conservation measures even though the rate of use increases.

Bill Sears from Black Star

Russia to our homeland and could deliver the war head so quickly that our warning would occur only 10 to 20 minutes before it arrived. This is a new factor in our thinking about what I call the "big" war. There is no question whatever but that, in the near future, Russia will be able to launch a devastating attack against this country from bases within her own national boundaries. What is our reply?

Defense and Offense

We are replying in two basic ways. First, we are working to improve our defenses by applying new science and the best technology to develop defenses against big ballistic missiles, as well as against big bombers. But no one can guarantee 100 per cent effectiveness for an air-defense system, and certainly not in advance of its trial in combat. So we need another kind of defense – an offensive kind of defense – and this is provided by our retaliatory force, which includes primarily the Air Force Strategic Air Command, but also many Navy and Army units.

Much effort is being devoted to assure the survival of this retaliatory force, no matter how heavy may be the initial attack against us. There are special operating procedures for big bombers, as well as a maximum effort to develop our own ballistic missiles. We intend to disperse our missile bases on land, and to hide some of them at sea on submarines. We also plan to make some of them impervious enough so that they will be able to launch missiles after a near-miss by an enemy hydrogen bomb. This is all to insure that any attack by an enemy using nuclear power will, with certainty, be followed by an effective attack of our own.

My personal opinion is that the Russians know that something we can honestly call "massive retaliation" would inevitably follow a surprise attack on us. They must know of our concentration of scientific, engineering, and military effort on defenses against their missiles, and the development of our own weapons. They can see the United States spotlight focused on these efforts. Their intelligence people – their G-2's – *must* have to report to the Kremlin that we shall surely achieve what we are after in these respects. In short, I believe we are well on our way to big war stalemate and effective deterrence of the big war.

Now you may think that the Russians would be unhappy about this; but I wonder. Perhaps they are secretly happy that we are giving so much attention to the big war. Perhaps they hoped we would do just what we are doing – devote our principal efforts to the big war problem. Perhaps they are glad that we are, in a sense, blinded by the glare of Sputniks in the sky, and that we continue to give national attention primarily to big bombs, big bombers, and the big war of international annihiliation.

New Strategy Needed?

Pehaps in the future the Russians intend to follow the strategy they have used consistently since World War II. So far as one can see, they have not seriously considered an actual attack on our homeland. Instead, as you know, they have combined local military pressure with subversion and propaganda to attempt to push us back on local fronts. We have had to react to these attempts in diverse ways: by providing military and economic help to Greece; by promising aid to Iran; by refusing to bow to transport problems in the case of the Berlin air lift; by taking military action in Korea; and last but not least, by providing convoy action at Quemoy.

Now the variety of these situations is impressive. They are all different. They are different in the nature of, and our reaction to, the threat. About the only characteristic they have had in common is that they were all limited. On both sides, actions were limited in area and in objectives. The national existence of no great power was in question in any of these actions. No one mentioned unconditional surrender. Neither side used, nor seriously threatened to use, its big bombs. This is actually the kind of action – military action – to which we, as a nation, should be accustomed.

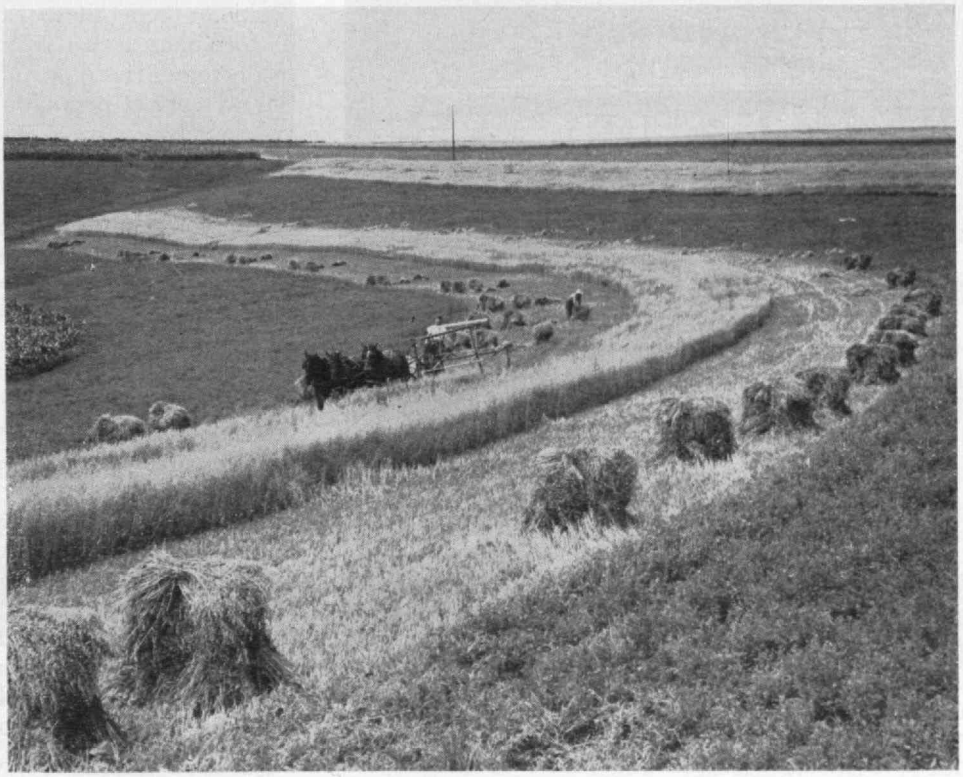
If you examine the record, I think you will find that World Wars I and II were the exceptions to, rather than the rule of, U. S. military action. It has not often happened that the surrender of one of the world's great powers was the objective of our military action. Usually, as in the engagements the Marines celebrate – the "Halls of Montezuma" and the "Shores of Tripoli" – we have used military force to assist our diplomats in arriving at some international agreement. Our long history indicates the importance of being prepared for such limited engagements, and Russia's recent series of acts has confirmed this for us again.

Preparation for limited war, in my opinion, should be the subject of much more national attention. If it were, many important questions would appear and could be debated in quite different circumstances. For example, should we have an elite force equipped with the lightest and best weapons suitable for limited war and provided with its own transport aircraft? Suppose this force started out as a small one which exercised and maneuvered as realistically as possible. One day, for example, it might be holding exercises at home. The next day, it might fly into a remote part of Africa, and a few days later be in Asia. As time went on and the unit learned more and more about its equipment and its problems, this force might be expected to grow in size and competence. The essentials of this plan would be to start with a small force, exercise it realistically, and let it grow as opportunity and necessity might dictate. This is the plan we have followed in the case of the Strategic Air Command, aimed at big war deterrence. Why not do the same thing for small war deterrence?

Another matter for open debate and public understanding is the necessity for close collaboration between military, political, and diplomatic groups in limited warfare. Since a limited war is fought to achieve an *agreement;* an agreement which would be more favorable than we could achieve without the application of force, the importance of military-diplomatic collaboration is clear. However, the objectives of this collaboration need to be well considered.

The Korean War, I think, is a case in point. Much was heard about the fact that, by political action, it was limited in area. Our military forces were not allowed to bomb beyond the Yalu River. I think you will agree that we heard impassioned denunciations of this political limitation. However, I am not sure that this criticism is the most important, nor the most serious, that we could make of the Korean operation.

To illustrate this matter, consider our behavior when we finally sat down to negotiate. At that time, we had effectively removed our military force as a factor in the bargaining. Perhaps it would have been more effective to say: "We agree to negotiate with your side but we intend to maintain our military strength in Korea, and failing an agreement in 30 days we reserve the right to take military action again." Perhaps a combination of political and diplomatic negotiations, *plus* the threat of military action, might have required less time at the conference table and produced a more favorable final settlement.



Through scientific efforts we have improved considerably the vigor and yield of most crops and we now handle and process them much better than in the past. We preserve foods better and, indeed, we now have respect for vitamins. Nevertheless, we still plant essentially the same crops as did our ancestors.

It seems certain that world problems of food production will inevitably be mitigated by knowledge resulting from intensified studies in the life sciences. We can even dare to hope that such knowledge will give us clues to new kinds of food which can be produced in some other medium than through the growing of green plants in the soil.

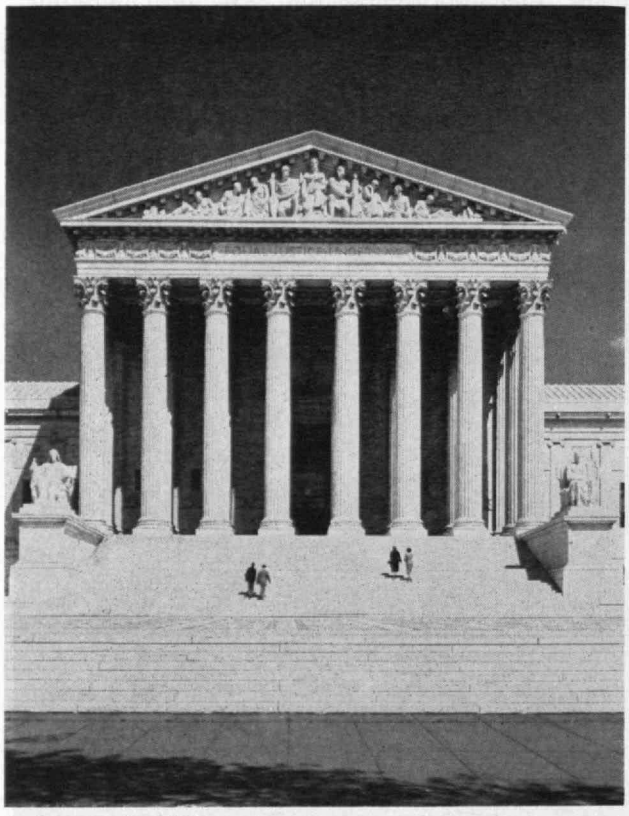
Soil Conservation Service

Human Relations with Other Nations

As soon as we introduce ideas of political-diplomatic action into a discussion of miltary matters, we immediately broaden the discussion to another area of challenge to our culture. This is the challenge that is evidenced by our problems regarding international politics, our international trade, our diplomacy; in short, our human relations with other nations and other peoples.

How should we behave in the Middle East where rising Arab nationalism appears to be revolting against ideas developed during the long period of European domination? How should we work with the countries we class as neutralist or uncommitted?

The relations we have with other nations of the world involve technical, as well as human, problems – both of which are interrelated, of course. In our relations with other peoples, let us look first at the technical problems. One reason for discussing technical problems is that, in my opinion, they emphasize our very great need for much more science and technology in the future. You notice I have used the word "need" – our "need" of science and technology for the future survival of our culture. We need not talk about the cultural values which science brings to our civilization. I am not here to expound on the virtues of this intellectually honest discipline so effectively combined with highly creative activity. Much as I would like to relate the joy of achievement which scientists and engineers so often experience, this is beyond the scope of my discussion. The point I wish to emphasize is that we need more science and more technology, not because these pursuits are worthy, but simply as a requirement for the future survival of our culture.



A. Devaney, Inc., N.Y.
Our challenge is to use our technical resources so that we remain strong, not only as a military power, but also as a peaceful civilization.

I have already implied that military matters should engage the attention of our scientists and engineers. It is not enough for them to be concerned only with the "big" war; they must also keep in mind our need for other kinds of military strength. Even more important, they must look beyond the military and see the political problems. For example, I believe it is imperative that we reverse the roles in which we and the Communists are cast throughout the newly nationalistic and neutralist world. At present we bear the stigma of European imperialism, while the Russians hold out the promise of an ideal state to come. For some reason, the Soviet record of human slavery and slaughter is overlooked in contemplation of their idealistic dream of a new and perfect state. On the other hand, to many underdeveloped peoples our standand of living appears to be nothing but an unhealthy materialism and our emphasis on economic and military aid often fosters the same opinion. Even with our deep belief in such ideals as the dignity of the individual, to the rest of the world we seem to be the materialistic group and the Russians the idealistic.

Strangers to our culture find it difficult to understand the actual society in which we live. The tendency is to assume that our capitalistic society is like the one Karl Marx wrote about, whereas it is quite different. It is difficult to figure out how we can counteract such a broad-scale misconception, and it is probably not a problem for an engineer, alone, to discuss.

However, there may be a possibility of changing some misinterpreted views in this connection, particularly those based on lack of understanding. This may require us to concentrate more of our scientific and technical effort to solve the very severe technical problems facing those peoples who have not yet been as fortunate as we in benefiting from science and technology. There are many such problems. One is the pressure of population.

Population Trends

Our own population is growing rapidly but the rest of the world is in the midst of what amounts to a population explosion. Merely to keep constant the standard of living, the world is going to need a lot more food. However, few peoples in the world will long be satisfied with their present standards of living, so still more food will be needed. Despite efforts to reduce the rate of growth, it seems inevitable that populations will continue to increase, that there will be corresponding needs for greater amounts of food, and pressing needs for more effective distribution of the available supply. The problem of distribution involves not only transportation but trade, and again this introduces nontechnical questions.

Returning to technical matters, we may remind ourselves that we still eat essentially the same foods our ancestors have been eating for hundreds of generations. In fact the biggest change in the food habits of the Western world occurred when our Eu-

(Continued on page 208)

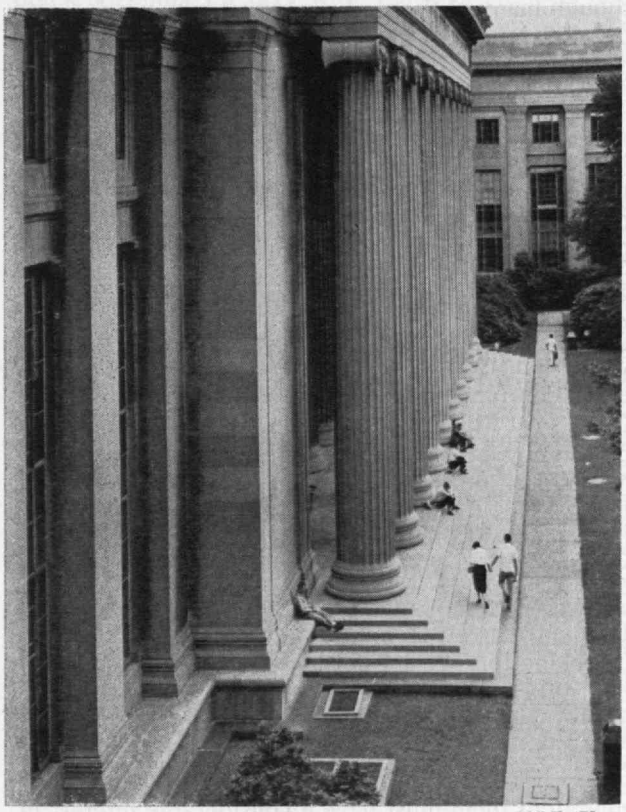
The Problems of College Admissions — I

Today, college admission is a complex operation with many facets in which parents, teachers, high school counseling personnel, and various examining bodies all play their roles

by B. ALDEN THRESHER

EACH year there occurs in the United States a "great sorting" by which nearly 1,000,000 boys and girls distribute themselves among some 1,800 institutions of more or less higher education. This is a social process of great complexity. The cultural and sociological forces which influence it are not wholly understood though some progress has been made in this direction. If a student and the college can be thought of as the primary actors in this drama, there are a great many other people who intervene at various stages in the process of mutual selection and who influence in greater or less degree the decisions that are made on both sides.

Because of the immense and healthy diversity of American education, we do not have the severe restriction of alternatives that characterizes higher education in many European countries. One consequence of this is that in the United States students, for the most part, select colleges. Only a few fortunate colleges can select students to any appreciable degree. This healthy diversity, whatever its inconveniences, is a chief source of progress; so far we have resisted the rigidifying process that is so likely to freeze educational experiment in older cultures where central control of policy and standards predominates.



M.I.T. Photo

For every student who enters M.I.T., the Admissions Office has spent much time and effort in counseling other students on collegiate education, but it regards its work as useful even though students may register at some other university.

The Admissions Problem

Thirty years ago college admission, on the surface, at least, was a simple matter. Each institution had what was known as admission "requirements" expressed as a list of high school "units" which a student was supposed to have completed before he could be accepted. Although in form these requirements were dictated by the colleges and universities, they were actually composed of the subjects conventionally studied in secondary schools; each institution presented minor variations and rearrangements of these as its criteria for admission. Examinations were often set by individual colleges, and by 1900, a number of institutions had established the College Entrance Examination Board to regularize this procedure, and to reduce the arbitrary and capricious variations in admission requirements.

Today, college admission is a complex operation with many facets. It is a multilateral activity involving not only the institution and candidates for admission, but parents, teachers, high school counseling and guidance personnel, testing and examining bodies of various kinds, and a broad fringe of interested friends and relatives. Admission, furthermore, is no longer a bilateral operation between the institution and the student. It takes place, rather, in a complex social environment in which the student looks at many possible institutions of higher education and makes some kind of a tentative selection among them, while each institution in turn looks at a great many potential students, and if it is fortunate enough to attract many, can exercise some degree of selectivity.

The admission operation at M.I.T. is a part of this complex process and cannot be thought of realistically in isolation from it. Students who applied for admission to M.I.T. last year applied on the average to 3.6 institutions, were accepted by 3.2, and entered one. To those to whom we offer admission in a typical year, some 125 other colleges will also have offered admission, and there will be something over 200 other institutions to which one or more of these young

H. Armstrong Roberts

Those who aspire to enter M.I.T. should have a considerable interest and aptitude for mathematics and science in some form, but aside from this, entering students show a wide range of diversified interests and objectives.

people will have at least made application. We are thus enmeshed in a network of comparisons, choices, and decisions, involving hundreds of institutions and thousands of candidates for admission.

One consequence of this situation is that the process of *selecting* an entering class, while important, represents a very minor fraction of the total time, effort, and funds expended in the admissions process. The overwhelmingly large proportion of our work goes to educational guidance in the broadest sense, including contact with secondary schools, teachers and counselors, prospective students and their parents, relatives and friends. Our mission includes the provision of information on a broad scale, not only about M.I.T., but about other institutions, and about the manifold opportunities awaiting those whose education is in some way oriented toward science.

It is extremely important that the student and parent who seek information about M.I.T. should be able to establish some real personal contact and the kind of psychological *rapport* which this connotes. We therefore keep an open door, encourage visitors, and are glad to sit down and discuss the educational problems of any potential freshmen at whatever length is necessary. This includes not only answering his factual questions but drawing him out about his interests, his activities, his ambitions, and his problems.

People plunge into the maelstrom of higher education with widely varying degrees of preparation. Some have given careful and systematic study to college catalogues, visited colleges, talked with informed friends and relatives, made maximum use of their high school guidance facilities, and in many other ways have prepared themselves to make a rational and wise decision about higher education. Others, having picked up random rumors, prejudices, and bad advice of assorted varieties, tend to ask immature and shortsighted questions, and in general to misread the values that lie partly hidden in the world of educational opportunity.

Every institution has the problem of combating oversimplified or outdated stereotypes which continue to misrepresent its true nature to the public. We have perhaps an unusually difficult problem in this regard at M.I.T. because M.I.T. has undergone such a radical and rapid evolution in the last 30 years. People know a lot about M.I.T. and most of it isn't so.

Thus our total educational mission is not confined to the teaching done within our own walls, but includes an obligation to convey to a wide segment of the general public some broad appreciation of the values inherent in higher education oriented around science. More important than the duty of excluding less qualified applicants is the function of attracting well-qualified ones. This, in turn, cannot take place unless a wide range of youngsters acquire reasonably realistic ideas about scientific education. The boy who comes here for the wrong reason, or because of a mistaken idea of what he is getting into, is seldom a good risk.

One corollary of this situation is that we spend a great deal more time on students who do not enter than on those who do. This is as it should be. In other words, our admissions operation forms an important part of the much larger process by which students consider many institutions and institutions consider many students. This process of "shopping around" and mutual appraisal is bound to take up a certain amount of time, energy, and cost on both sides. It is, however, quite unrealistic to regard time and effort spent on information and guidance as wasted, even though many of the students with whom we deal end up elsewhere.

Is There an "M.I.T. Type"?

Admission to M.I.T. must be studied in relation to the kind of institution which M.I.T. is and is becoming. M.I.T., although still in name an institute of technology, has undergone a profound revolution in the past generation. In Dr. Killian's striking phrase, we now have a "university polarized around science," as its unifying principle. Just as the classics, that is the history and literature of the ancient Mediterranean world long served as a central focus for university education (and indeed for almost all European culture), so at M.I.T. the extension of science, its history, philosophy, applications, and its ramifying influences in politics, industry, and the arts, provide a central theme. This theme acts as a harmonizing and unifying influence to draw together the varied interests of our five schools and 21 departments.

This fact profoundly affects our admissions policy. People frequently ask us what type of student M.I.T. is looking for. We are not looking for any single type but rather for young people of exceptional ability and promise in the entire broad spectrum of human personality, interests, and aptitudes. Our student group has only one basic thing in common, that is, that all of them must have a considerable interest in, and aptitude for, mathematics and science in some form. There is not a single curriculum at the Institute that does not contain a substantial sequence of mathematics and physics. Whatever his other qualifications,

and we hope he will be versatile and have broad interests, a student must be able to cope with this kind of rigorous, quantitative thinking and find it interesting, otherwise there is no place for him here.

Once we grant this unifying central tendency, however, we still are left with a vast possible range of human diversity. At one end of the spectrum are the people who will make research scientists. These are very rare and have exceptional intellectual qualities. They will normally go on to a doctorate here or elsewhere, and there never are enough of them. Then we have various categories of people in the more technical phases of engineering, research, and design, whose qualities approximate those of the scientist, though often with more of the synthesizing, integrative qualities of the engineer. We have people, some of whom are engineers, some not, whose bent is for operation, or construction, or production, or management, as well as architects and city planners. All of these people need broad education in science and the arts, in the ways of man in society, in the policy problems of government and industry.

We have, furthermore, people with many interests that include science but who do not intend to become professional scientists or engineers. Some of these take double majors in humanities and science on either a four- or five-year basis. We have students who go on to journalism, law, teaching, medicine, or to research in the biological sciences, and a host of other possibilities, including the foreign service, the ministry, finance, and insurance. In other words, given the basic fact of an interest in mathematics and science as the central theme of an education, our students encompass a very wide range of subjects and move into every conceivable kind of occupation. We do not regard these as odd deviants from a normal professional groove. On the contrary, we feel that M.I.T. makes a major contribution to the public welfare by seeing to it that responsible people in many walks of life have had the kind of grounding in science as part of a broad liberal education which will best fit them for leadership in the contemporary world.

What we are seeing, therefore, at M.I.T. is an increasing recognition of the *exploratory* function of education and of the postponed professional commitment. A generation ago, our curriculum was a congeries of professional programs in science, engineering, and architecture; this still remains its dominant theme. But there is a considerable and rapid increase in the proportion of students who look at an undergraduate education, not simply as a professional training or even the first stage of a professional training, but as an exploratory process which gives them a many-sided acquaintance with the intellectual world, and by giving them an opportunity to try their wings in a number of areas to form a more just conception of the kind of life work which would best suit them. While M.I.T. continues to provide the preparatory function of education, it is rapidly increasing its attention to the exploratory function.

Along with this goes the tendency to postpone a commitment to a particular professional field. Nominally, all our undergraduates choose, at the beginning of the second year, a professional area of concentration, but if we study the history of our Alumni after graduation we see that the pattern of M.I.T. as a purely professional training has never been closely adhered to. Our people have always gone into an immense range of activities – in business, industry, the professions, commerce, and the arts. What has happened in recent years, however, is that the design of our curricula has begun more realistically to take account of this long-standing tendency and has provided programs in which the exploratory function of undergraduate education, and the more generalized approach, are explicitly recognized. The tendency, already highly developed in science, for an increasing proportion of people to need postgraduate study is rapidly spreading to all the engineering fields, and it is seldom, under contemporary conditions, that a four-year education can adequately prepare a man for the higher reaches of professional work in engineering.

Science, in the broadest sense, gradually becomes a major, if not the major, theme which runs through all higher education. It will be increasingly difficult to hold scientific education within any particular professional groove. M.I.T., therefore, will take its place as contributing to the broad flow of intellectually trained people who will play their parts in all aspects of government, industry, and community life.

All of this has a profound importance for our admissions policy. It means that we are not looking for narrowly defined patterns of individuals who will fit neatly into specific professional slots. A school of medicine, of law, or even of business might more properly look for patterns of this kind; we do not. The wide spectrum of types of personality and points of view indicated above will continue to be sought after. Together with the common core of interest in mathematics and science, there must be an intellectual curiosity, breadth of interest, and above all, energy – physical and intellectual – which will carry a considerable proportion of our people beyond an average or mediocre level of achievement. The great protec-

The nightmare of every admissions officer is the young man who is rejected as a poor risk and who turns up 20 years later with a Nobel prize. But we do accept a large number of students whose exceptional potentialities can scarcely be perceived at age 18, and many of whom surprise us by eventual achievements of outstanding merit.

M.I.T. Photo

M.I.T. Photo

Mrs. Julius A. Stratton and President Stratton greet visitors in the Institute's annual Guidance Conference held at M.I.T. for secondary school teachers and administrators.

tion of any selective admissions process is diversity. We are, to be sure, quite certain to miss many able people in our efforts at selection; the nightmare of every admissions officer is the young man who is rejected as a poor risk and who turns up 20 years later with a Nobel prize. To offset this peril, however, we do accept a large number of students whose exceptional potentialities can scarcely be perceived at age 18, and many of whom will surprise us by eventual achievements of outstanding merit.

Broadening the "Interface of Contact"

The admissions process at M.I.T. is thus an operation of broad scope in the areas of educational guidance and public relations. We are in some kind of contact with something like 20,000 potential freshmen a year who either write to us, visit us, or see one of our school visitors or an Educational Council member. Each of these has an opportunity to consider M.I.T. as a possible place for his education, and it is from these that the entering class of 900 is drawn. Our problem of information and guidance involves not only this large number, but their parents, teachers, advisers, relatives, and friends. Since it is out of the question for so great a range of contacts to be carried on by a small staff in the Admissions Office, we broaden out our area of communication with the educational public in four ways:

First, there is the program of Institute publications. In addition to the general catalogue, which is used both internally and as a source of general information on a wide variety of fronts, we have an undergraduate catalogue designed specifically with the needs of the prospective freshmen in mind. In this we strive to avoid the dullness of the typical college bulletin and to convey, so far as is possible in words and photographs, a realistic idea of what student life for the undergraduate is like here at M.I.T., minimizing rules, timetables, and purely formal statements. There is also a basic leaflet about admissions, as well as a number of special leaflets on lesser-known aspects of the undergraduate program.

Second is the program of visiting schools which has been greatly augmented in the last few years. Each year, some 35 members of the Faculty and Administration spend a week or more visiting secondary schools in all parts of the United States. This involves a great deal of preliminary correspondence and scheduling, since no school is visited without an invitation from the principal and an actual appointment made in advance. The school visitors are predominantly younger members of the teaching Faculty, but include also members of the Admissions Office staff as well as other administrative officers. As one result of this program, we now have on our Faculty a group of nearly 200 younger men who have had some direct contact with high schools and their problems. As a result, they have a much more realistic grasp of the problems of the transition from secondary school to higher education than is usually found in college faculties. We see, at M.I.T., little of the "teacher's syndrome" – that wonderful, unconscious arrogance found among teachers at every educational level who are prone to assume as a matter of course that no student has had a really adequate preparation until he reaches the particular teacher in question.

The whole tone of these visits to schools is one of educational guidance and information. The schools realize that they have a formidable problem of guidance in conveying to a new crop of youngsters each year some appreciation of the values inherent in higher education. This is particularly difficult in the areas related to science, where so many misconceptions exist. As soon as the schools discovered that we conduct these visits as a broad-minded effort to give educational guidance, rather than as a selling or recruiting project, they welcomed us warmly. Some even utilize the visits of the M.I.T. representative as a normal, annual part of their regular educational guidance program.

Most members of the Educational Council know at first hand how the school visiting program works from having accompanied school visitors on their rounds. These joint visits are encouraged since they help both the visitor and the Alumnus. We normally visit about three schools a day, talking with a carefully preselected small group of students in a kind of informal guidance seminar. This is more useful than making speeches to large assemblies on the one hand, or than interviewing a few individuals intensively on the other. In a stimulating question-and-answer session, often attended by school guidance counselors as well, students feel they have made direct personal contact with an Institute representative, as indeed, we feel, they have.

Our third device for broadening our contact is the annual Guidance Conference. We hold annually here in Cambridge each fall, a conference on educational guidance to which we invite about 100 carefully selected guidance counselors from high and preparatory schools all over the United States. It is necessary partially to subsidize the travel expenses of this group in order to make it possible for them to come at all. Here also we try to avoid the propagandist and selling approach.

(*Continued on page 216*)

A Tooth for a Tooth

The old Biblical adage takes on new meaning as new plastics, high-speed drills, precision-casting methods, and improved techniques make dental procedures relatively comfortable

by FREDERIC W. NORDSIEK

SOME 30 per cent of the healing practitioners of this country are dedicated to caring for less than 1 per cent of the human body; yet they are waging a losing battle. The human teeth constitute less than 1 per cent of the body, whether gauged by bulk or weight. There are about 100,000 dentists in the United States who devote their time and skills to treating, repairing, extracting, and replacing teeth; and there are only about a quarter of a million physicians to minister to the rest of the human body.

Yet the dentists never catch up with their work — indeed, under present conditions, they never could. Take New York City, a community relatively privileged in having some 9,000 dentists to take care of the mouths of its 8,000,000 people. Each of these people may, according to authoritative local surveys, be expected to develop, on the average, a new tooth cavity each year. But, among them, New Yorkers right now have about 35,000,000 untreated tooth cavities. A total of some 40,000,000 hours in the dental chair would be needed to repair these defects at present existing, and it would take a dental task force at least three times as large as New York's currently existing one to accomplish such a gigantic repair job. Similarly precise knowledge of dental needs and facilities is not available for the country as a whole; but one authoritative estimate holds that, throughout the United States, not more than a quarter of the needed dental care is being provided.

Thus, although American private citizens pay dentists some one and a half billion dollars per year — a sixth of their total medical expenditures — and also through taxes and donations support much free dental care for underprivileged persons, the teeth of Americans, by and large, are in sad shape. For example, missing or bad teeth were the largest single cause of medical rejections among the first 2,000,000 men examined for service in World War II. Six or more upper teeth meeting six or more lower teeth were then deemed to be adequate equipment for coping with Army chow; not a very stringent standard considering that a full complement is 16 teeth in each jaw. But nearly 10 per cent of the draftees, from ages 18 to 35, did not have six pairs of teeth that met!

Animals and Early Man

As the human being has struggled upwards to the pinnacle of evolutionary development, he has left good teeth behind him. The lower vertebrates, the nonhuman mammals, ancient man, and even present-day primitive men still living in their original natural environments, by and large have sturdy teeth.

The human being, like the other mammals (but in contrast to the lower vertebrates) has a limited and definite number of teeth. The human dental equipment, together with that of some animals, is shown in Table I. Human deciduous teeth start to erupt at about the age of six months, and start to be replaced by the permanent teeth at the age of about seven years. By the time a human being is some 11 years old, he usually has all of his permanent teeth except the third molars (wisdom teeth) that may or may not appear some time between the 15th and 21st year of life. Most mammals, like man, have two sets of teeth in the course of life, although bats and guinea pigs shed their deciduous teeth before they are born!

As Table I indicates, the lower vertebrates (for example, sharks) have an indefinite number of undifferentiated teeth, and these creatures usually have relatively large numbers of teeth. Indeed a reduction

Harold M. Lambert

Now that dental procedures have become relatively comfortable, surely everyone can afford the services of a competent dentist and will want to do so regularly.

TABLE I

The Teeth of Man and Various Animals

Species	*Jaw*	*Left Side*				*Right Side*				*Total*
		Molars	*Premolars*	*Canines*	*Incisors*	*Incisors*	*Canines*	*Premolars*	*Molars*	
Man— Deciduous teeth	Upper Lower	2 2	0 0	1 1	2 2	2 2	1 1	0 0	2 2	20
Man— Permanent teeth	Upper Lower	2-3 2-3	2 2	1 1	2 2	2 2	1 1	2 2	2-3 2-3	28-32
Old World Monkeys	Upper Lower	3 3	2 2	1 1	2 2	2 2	1 1	2 2	3 3	32
New World Monkeys	Upper Lower	3 3	3 3	1 1	2 2	2 2	1 1	3 3	3 3	36
Horse	Upper Lower	3 3	3 3	1* 1	3 3	3 3	1* 1	3 3	3 3	40
Bear	Upper Lower	2 3	4 4	1 1	3 3	3 3	1 1	4 4	2 3	42
Pig	Upper Lower	3 3	4 4	1 1	3 3	3 3	1 1	4 4	3 3	44
Opossum	Upper Lower	0 0	7 7	1 1	5 4	5 4	1 1	7 7	0 0	50
Lower Vertebrates	Upper Lower	Indefinite Number of Undifferentiated Teeth								

* The canine teeth of the horse are small and nonfunctional; the gap thus created is occupied by the metal bit used to control domesticated horses. [Nordsiek, Frederic W. "Horse Power," *The Technology Review*, 60:307 (April, 1958).]

in number of teeth is considered to mark evolutionary advance, associated with terrestrial life, less bulky food, more chewing, shorter jaws, and stronger muscles of mastication. This trend is currently operating in human teeth. Thus the wisdom teeth, although invariably present and well developed in primitive human beings such as the Australian aborigines, do not always develop in more highly evolved, more civilized man. For example, the present writer (a highly evolved type) never did have lower wisdom teeth and, by x-ray evidence, does not even have vestigial evidences of these teeth in unerupted form.

Modern human teeth really have only two mechanical functions in connection with eating — shearing and grinding. The incisor teeth in the front of the mouth act like scissors, and thus make possible the taking of dainty bites from comestibles such as sandwiches. Tidbits like these, as well as portions of food forked or spooned into the mouth, are ground to an easily swallowed state by the premolars and molars which are located towards the rear of the oral cavity. The four canine teeth surviving in the human mouth are vestiges of tusks or tearing teeth that serve carnivorous animals for fighting, as well as for eating; modern human canine teeth have some shearing action but are inefficient in this regard because of their tusk-like shape.

It is noteworthy that in ancient primitive man, who was invariably prognathous, the incisors did not have a shearing action, but came directly together face to face and wore into flat grinding surfaces. These ancient peoples had no need to cope decorously with food items such as sandwiches, but used all of their front teeth to crush and tear foods, just as predatory carnivorous animals, like lions, do today.

Tooth and Claw

Wild animals employ their teeth and their claws for weapons and for tools, as well as using their teeth for eating purposes. Animals' teeth withstand such vigorous usage because they are sturdy, and also in some species because they are regularly renewed. Many lower vertebrates, for example the sharks, are "polyphyodont"; that is to say, new sets of teeth continue to grow into place throughout their lives. Thus in sharks, there is a line of teeth in active service at the edge of the jaws. Behind these are successive rows of progressively smaller spare teeth, that steadily grow and advance forward into the line of duty as their forerunners are worn, broken, or shed.

In other beasts, such as rodents and horses, there is only one adult set of teeth, but individual teeth continue to grow up afresh from the roots as fast as they wear away at the crowns. To be sure, in rodents this usually fortunate endowment can by accident have bizarre and fatal consequences. The two upper incisor teeth of these creatures wear against the two lowers, and thus keep in suitable balance. If the beast accidentally breaks an incisor, the opposing tooth has no check upon its size; it keeps growing until the mouth cannot be closed and starvation ensues.

As we have seen, the human being, like all mammals, is "diphyodont," meaning that in the course of a lifetime he is privileged to enjoy only two sets of teeth. Is it not ironical that the human teeth, which man needs so very much – to eat, to talk, and for cosmetic reasons – do not have the ability to replace or regenerate themselves, as do the teeth of some other vertebrates; whereas human claws (fingernails and toenails) which nowadays find only limited and dispensable use (such as for picking up coins, for opening jackknives, or for scratching itches) continue to regenerate as vigorously as did the constantly used claws of our evolutionary forebears, and as do those of present-day animals. Hence a paradox: On the one hand, we must pamper, patch, and prop our valuable but weak and irreplaceable teeth; on the other hand, we must waste innumerable hours to cut and file our useless fingernails and toenails, or else spend many dollars to delegate nail trimming to manicurists and podiatrists. Also the vigorous regenerative powers of human nails leads to that uniquely human ailment, ingrown toenails. If only human teeth could regenerate as vigorously and insistently as do human nails!

Why So Weak?

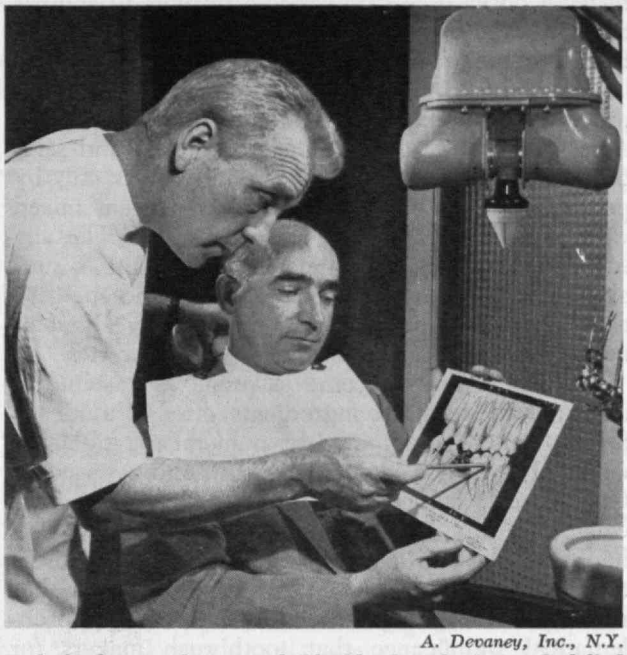
Why are human teeth so frail? A rephrasing of this question will point up the difficulty in answering it. Why are most human teeth so frail, whereas some others are so very sturdy? There are as many imponderables as ponderables in the picture of tooth decay. Human teeth, even those of siblings who have been exposed to apparently identical environments, vary widely in chemical composition, physical structure, and durability. Heredity is very likely a factor in dental health; but in any species as mixed up genetically as is the human being, hereditary factors are always difficult, sometimes virtually impossible, to assess.

Diet, especially in early life, very likely plays a role in dental welfare. The element fluorine, which as we shall see presently is today's bright hope in reducing tooth decay, may be regarded as a dietary factor; although it is consumed more in drinking water than in foods. Certainly diets low in calcium, in phosphorus, in vitamins A, C, and D, or in protein, are not conducive to dental health, any more than they are conducive to general health.

Malocclusion, severe enough to cause mechanical stresses or excessive abrasion on particular teeth, poses a definite dental threat. Similarly, habitual gritting, grinding, or clenching of the teeth, which in some people may occur during sleep as well as during waking hours, may cause considerable tooth damage. Still another source of mechanical injury to teeth is the widespread, if infantile, human need for oral gratification, fulfilled by placing in the mouth (often between the teeth) hard objects such as cigarette holders or pipestems or, in nonsmokers, by chewing articles such as pencils or paper clips.

How Teeth Decay

Thus any person's teeth may either be susceptible to decay or else resistant to decay, depending upon the nature of his teeth and the chemical, biological, and mechanical conditions existing in his mouth.



A. Devaney, Inc., N.Y.

Today's dentist, that remarkable blend of healer and skilled mechanic, can do wonders with his modern armamentarium.

These factors, in turn, may be attributed to ponderable and imponderable genetic, developmental, and environmental causes. It is clear, however, that the immediate local effect causing most dental decay is a combined bacterial and chemical action in the mouth. Mechanical abuse of teeth is, at most, a contributory cause; injury by thermal shock, as by the alternating ingestion of hot and cold foods or beverages, is suspected but not clearly indicted.*

Hence a logical question is: "Why not prevent local bacterial-chemical action on the teeth?" This is a most desirable objective, but to date an unattainable one. The mouth cavity cannot be kept free of microorganisms any more than can other parts of the human digestive tract. An antiseptic potent enough to significantly destroy mouth bacteria would also seriously injure mouth tissues. Even if the mouth could be sterilized, it would promptly be reoccupied by microorganisms taken in with air and food.

To some degree, microorganisms in the human mouth may attack the tooth structure directly, but mainly do their mischief by generating acids while thriving upon substrates provided by food residues. Why not, then, eliminate the food residues? Such elimination is attempted and in some measure achieved by the customary brushing of the teeth; but to be at all effective, brushing would have to be done immediately after ingesting foods or beverages. Even then, brushing is only partly effective, because food residues lodge securely in inaccessible crevices and otherwise resist removal. Laboratory animals ordinarily subject to dental caries may be kept caries-free by feeding them through stomach tubes so that their feed does not come in contact with their teeth. Anyone wishing to adopt, for his own use, this method for preventing tooth decay may find the necessary equipment in most well-stocked drugstores.

The latter comment was intended to be facetious, but drugstores and other retail outlets do conduct a

* "Blow Hot, Blow Cold," *The Technology Review*, **57**: 469 (July, 1955).

thriving business in supplies that purport to combat tooth decay, namely toothbrushes and dentifrices. Here our humor must turn from facetious irony to low comedy, for dentifrices and toothbrushes have provided a field day for the fatuousities of those great American institutions, popular advertising and sales promotion. As any dentifrice can do its work only by providing a suitable soap or other detergent mixed with a mild abrasive, and as toothbrushes, like any sort of brush† can be nothing more or less than suitable bristles set in a convenient handle, competitive claims for these products are of necessity about as nebulous and inane as those made for cigarettes.

Dentifrices have become as prone as gasoline to claims of added magic ingredients, often of unidentified nature and designated by numerals or gibberish names. Flavor is a big selling point, and even color. One recently launched toothpaste emerges from its collapsible tube in gay stripes of red and white! Perhaps the color approach represents a trend, because a toothbrush having bristles of two different colors has recently reached the market. Other features of problematical significance that toothbrush makers (or more likely their advertising agents) have brought forward include special arrangements of the bristle tufts, use of a succession of novel synthetic fibers for bristles, various shapes of handles, and bristle heads attached to handles at bizarre angles. Gadget appeal has recently been applied to dentifrices as well. One may now obviate the fatiguing necessity of squeezing a collapsible tube by adopting a newly introduced dentifrice that is packed in a push-button dispenser.

Tooth Composition

Despite their frailties, teeth are nevertheless the hardest and densest tissues of the human body. Their structure and composition are variable and complex; included are organic, as well as inorganic, substances. Suffice it to point out here, however, that the enamel, the hard outer layer of the teeth, is principally calcium phosphate and fluoride, with some calcium carbonate and magnesium phosphate, traces of other salts, plus about 4 per cent organic matter.

Calcium, phosphorus, magnesium, and fluorine for tooth construction must be taken into the body from the outside, in food or drink. It is virtually impossible to consume diets deficient in phosphorus or magnesium. Calcium deficiencies are not uncommon, but may easily be avoided by careful inclusion of protective foods, such as milk and milk products. It is fluorine, the remaining element, that has turned out to be a key to improvement of dental health. To be sure, fluorine compounds in *substantial* amounts are toxic; sodium fluoride, for example, is a widely used cockroach poison. But in *trace* amounts, fluorides have proved to be a governing and fortunately a controllable favorable factor in dental welfare. How this fact was established and brought to practical application is an absorbing tale of the pursuit of scientific truth.

Colorado Stain

In 1902, Frederick S. McKay, then a neophyte dentist practicing in Colorado Springs, Colo., became interested in a locally prevalent brown discoloration of the teeth, popularly called "Colorado stain" and known to dentists as "mottled enamel." McKay kept careful records of tooth conditions he observed in local patients, collected epidemiological data on the occurrence of mottled enamel in his and other communities, and enlisted the interest of other workers in pursuing parallel and divergent pathways of investigation of the topic. As McKay's records on individuals having mottled enamel accumulated, it soon became clear to him that these people had much fewer dental cavities than the general population.

By 1916, the studies by McKay and his collaborators had reached the point of suggesting that something in the drinking water of communities like Colorado Springs was the causative agent of mottled enamel. But not until 15 years later were chemical analytical methods of sufficient precision (spectrophotometry) developed to quantify the very small concentrations of fluorine found in drinking water, and to indict (or, as it later turned out, to acclaim) fluorine as the active agent. Around 1931, it was established that all water supplies tested contained trace amounts of fluorine, ranging from a small fraction of a part per million to some 18 parts per million. The mottled enamel communities were those with relatively high fluorine water supplies.

Thereupon the first fruits of this research were plucked; alternative water sources were developed for the mottled enamel communities, and soon "Colorado stain" disappeared. But this was a purely cosmetic gain, for mottled teeth, although unsightly, were by and large exceptionally strong teeth.

By now further study of the data accumulated through the decades, while mottled enamel was being studied, yielded findings that were to benefit the whole country – indeed ultimately the entire civilized world – not just the relatively few residents of the old "mottled enamel" areas.

(Continued on page 204)

TABLE II

Each year since fluoride adjustment of water supplies was launched in 1945, more and more Americans have received the benefit of this aid to better teeth.

Year	*Fluoridation status at end of each year*		
	Number of communities	*Number of water supply systems*	*Population*
1945	6	3	231,920
1946	12	8	332,467
1947	16	11	458,748
1948	24	13	581,683
1949	46	29	1,062,779
1950	95	62	1,578,578
1951	329	171	4,948,259
1952	709	353	13,552,501
1953	949	482	17,080,930
1954	1,128	571	21,208,304
1955	1,274	667	24,775,698
1956	1,487	759	31,416,112
1957	1,631	870	33,294,899

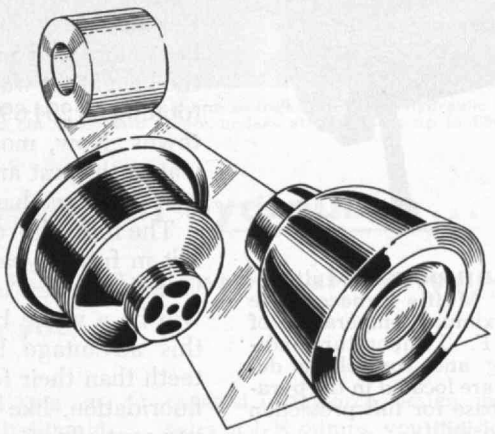
From: *Public Health Reports*, July, 1958, page 465

† "No Brush-off," *The Technology Review*, 53: 465 (July, 1951).

BUSINESS IN MOTION

To our Colleagues in American Business . . .

Although miles apart in their functions the door knob and sink strainer shown below have one thing in common. Both are made from Revere Brass Strip. Revere Leaded Brass Strip was used to make the sink strainer because of the ease with which large diameter threads are machined, the excellent surface it develops for chrome plating, the inherent corrosion resistance of brass and its drawing characteristics (strainer had to be drawn from .065″ gauge x 7″ strip to a 2½″ depth).



The Revere Brass Strip used by the manufacturer of seamless, one-piece door knobs possessed still other characteristics that made it the most desirable for that specific purpose. Because of the unique procedure by which these knobs are made the brass has to be able to stand up under some mighty rugged going. Further, the brass strip has to be of uniform gauge and be without any sign of fracture or crimping when drawn, as well as have consistently correct grain structure to insure a smooth, flaw-free surface on the finished knobs without extensive finishing and polishing operations.

These are but two of the literally thousands of ways Revere Brass Strip makes it possible for manufacturers to offer *their* customers a superior product at the lowest possible cost.

The combination of unusual properties makes Revere Brass Strip, in various anneals and tempers, equally suited to stamping and spinning. Manufacturers have found that the high ductility and malleability of various Revere Brass Alloys effect savings in time and cost because deeper draws in one operation are possible. And, because of the low, work-hardening rate, a combination of forming processes is frequently possible in making intricate shapes without the need for intermediate annealing. Should annealing be required the temperatures used are low (usually not over 1100° F.) which means lower fuel cost.

Revere Brass Strip not only permits deep draws, but fast draw speeds as well, which is particularly desirable for repetition press work or other operations where parts are produced in large quantities. This means relatively low power consumption.

Revere Brass Strip does not foul dies quickly, requiring only a minimum of die re-dressing. And one of its most desirable features is that it plates well and polishes easily, requiring only a minimum of finishing.

Revere Brass Strip in its various alloys is still another example of how, by fitting the metal to the job, it is possible to produce superior products at the lowest possible cost.

Practically every industry you can name is able to cite similar instances. So we suggest that no matter what your suppliers ship you, it would be a good idea to take them into your confidence and see if you cannot make a better product at lower costs by specifying exactly the *right* materials.

REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

Executive Offices: **230 Park Avenue, New York 17, N. Y.**

TOOTH FOR A TOOTH

(Continued from page 202)

Fluorine Reduces Decay

The dental records of the people whose tooth conditions had been compared with the fluorine level of their drinking water pointed clearly to a "golden mean" of about one part per million of fluorine. At this level, tooth decay did occur but was relatively rare. In communities where the water contained much less than one part per million of fluoride, dental caries was widespread. Then, as already stated, at high fluoride levels of 15 parts per million or so, unsightly mottled teeth occurred.

These findings led to the obvious, inexpensive, and entirely practical procedure of adjusting the fluoride content of municipal water supplies by adding controlled amounts of fluorine salts. When first launched, fluoridation of water supplies became a focus of opposition, largely of an emotionally polemical nature, just as had smallpox vaccination, water chlorination, and vitamin enrichment of bread and flour when they were first introduced. Nevertheless, scientifically established fact and the general welfare are, as ever, prevailing in the course of time. Controlled fluoridation of water supplies was first carried out at Grand Rapids, Mich., on January 25, 1945. Table II shows how more and more Americans have come to enjoy the benefits of water fluoridation – by the end of 1957 totaling 33,294,899 people dwelling in 1,631 cities and towns. Now, most large U.S. cities fluoridate their water; the rest are expected to do so soon. Fluoridation costs less than $0.20 per resident per year.

The full value of water fluoridation will make itself felt in future years. Fluoridation is most effective in young children less than eight years of age, and it will be a while before the youngsters now enjoying this advantage become adults possessing sounder teeth than their forebears. Let it be emphasized that fluoridation, like any biological measure, is not 100 per cent effective. It does, however, accomplish a reduction of well over 50 per cent in dental decay.

Dental Skills

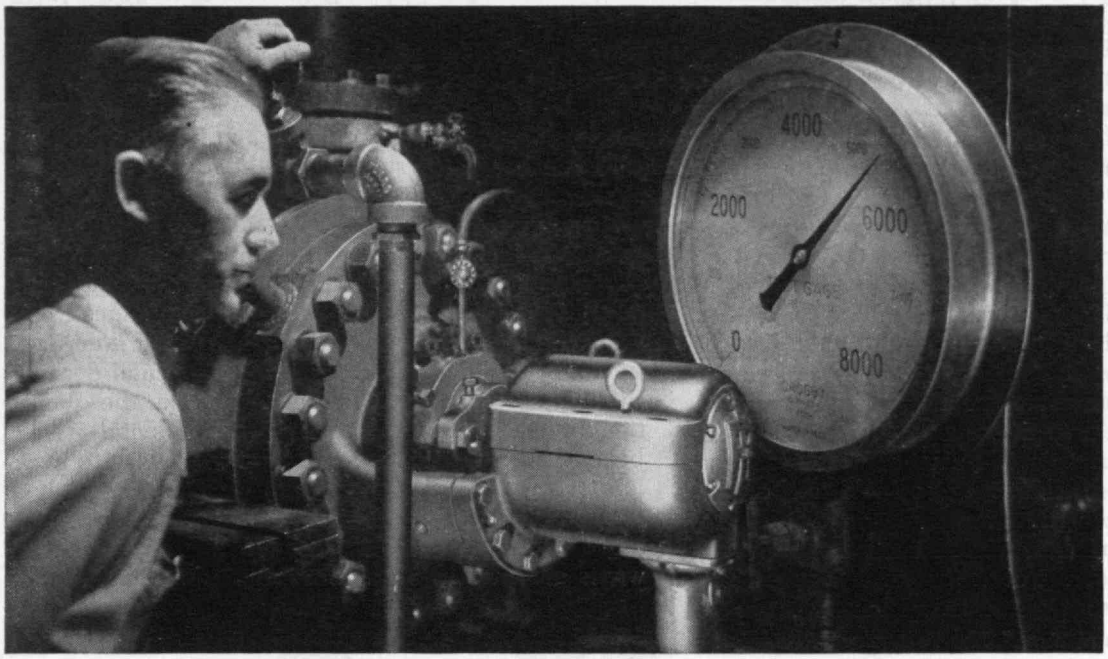
Meantime the training of an increasing number of dentists and rapid advances in dentistry techniques bode well for the care of already existing dental defects. Today's dentist, that remarkable blend of healer and skilled mechanic, can do wonders with his modern armamentarium. Drilling, most troublesome of the dental procedures, has been made relatively innocuous by a series of mechanical advances, culminating lately in the introduction of ultra-high-speed drills that virtually eliminate perceptible vibration.‡ Less than a decade ago, the speed of 6,500 revolutions per minute was standard for dental drills; now speeds of up to 250,000 r.p.m. are used. Ingenious air- and water-spray arrangements take care of the increased heat generated by the high speeds. Of course these tools cut faster, thus conserving substantial amounts of the dentist's precious time as well as reducing the duration of discomfort for the patient.

(Concluded on page 206)

‡ "Open Wider Please," *The Technology Review*, 57: 280 (April, 1955).

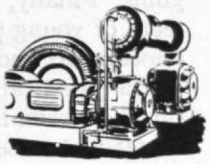
YOUR LEADERSHIP CAREER

with INGERSOLL-RAND



Testing a double-case, high-pressure, boiler-feed pump in Ingersoll-Rand's hydraulic laboratory. Pumps of this type feed hot water into steam boilers at pressures up to 6500 psi.

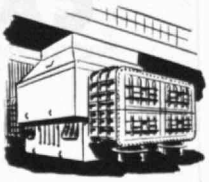
also means LEADERSHIP in



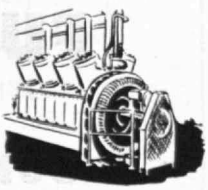
Compressors and Blowers

Rock Drills

Air & Electric Tools



Steam Condensers



Diesel & Gas Engines

If you are interested in hydraulics...

Here's what Pump Engineering at Ingersoll-Rand can mean to you...

No business or industry could long survive without *pumps*. Their vital liquid-moving function is a fundamental part of our modern civilization. That's why pump engineering offers such a varied and fascinating career – cutting across virtually every branch of every industry.

Ingersoll-Rand's Cameron Pump Division in Phillipsburg, N.J., is one of the oldest, largest and most progressive pump manufacturing plants in the world. As an engineer engaged in research, design, manufacture or sales of I-R pumps, you can be sure of three things – prestige, permanence and progress. The Company is a leader in its field, and so are the men you will work with. Here, long-range security and opportunities for advancement are second to none. For further information on leadership careers at Ingersoll-Rand, contact your Placement Office, or write to Ingersoll-Rand, 11 Broadway, New York 4, New York.

EXCELLENT OPPORTUNITIES NOW AVAILABLE:

- Sales Engineering – ME, IE, EM, EE, CE – Bachelor
- Design Engineering – ME – Bachelor & Master
- Production Engineering – ME, IE – Bachelor
- Business Engineering – Engineering & Business Degrees – Bachelor & Master

Ingersoll-Rand

10-689 11 BROADWAY, NEW YORK 4, N. Y.

Among the many graduates of Massachusetts Institute of Technology at Ingersoll-Rand are: L. C. Hopton, 1926, *First Vice-President and Secretary;* P. J. Bentley, 1925, *Vice-President.*

TOOTH FOR A TOOTH

(*Concluded from page 204*)

Pain during dental operations is controlled by skilled local anesthesia or by gas analgesia. In the latter procedure, a gas inhalation anesthetic is administered at a low rate. The patient is lulled to the point of being unable to experience pain but is sufficiently conscious to sit up, expectorate when directed, and otherwise co-operate.

The familiar silver amalgam tooth filling has been improved by standardizing composition and density of the amalgam during mixing, and by regulating packing during insertion.§ Precision-casting methods enable the preparation of gold inlays that fit so well as to scarcely require an adhesive to hold them in place. Recently developed plastics allow the skilled dentist to provide lightweight, well-fitting bridges and dentures to replace missing teeth. And of course the dentist or his associate, the dental hygienist, clean and scale the teeth to improve appearance and, to some extent, promote well-being of the teeth and gums. Finally, orthodontists can mold malformed teeth of young people into an ideal "bite," to benefit appearance, and ultimate welfare of the teeth.

The practical courses of action toward good teeth this discussion has suggested are perhaps more effec-

§ "Defy the Tooth of Time," *The Technology Review*, **55**: 415 (June, 1953).

Practical Action

tively applicable to the reader's children than to the reader himself. The eating of a well-rounded diet, including liberal amounts of the vitamin-, mineral-, and protein-rich protective foods, throughout life is a commendable practice for general well-being, not just for dental welfare. Now that dental procedures have become relatively comfortable, surely everyone who can afford the services of a competent dentist will want to do so regularly. Anyone can find the time and energy to brush his teeth, employing for the purpose whatever dentifrice suits his aesthetic and gustatory preferences, and whatever make of toothbrush provides such gadget appeal as pleases him. Virtually universal fluoridation of water supplies now appears to be an inevitable eventuality, but if the enlightened reader comes against controversy on the subject, he will do well to throw his weight in favor of fluoridation. As to the many imponderables in dental decay, there is obviously little one can do. Take the question of possible hereditary factors in dental well-being. It has been stated that those who wish to live long should select long-lived ancestors; similarly, those who desire good teeth should make sure they have forebears thus endowed. But then everyone wants good teeth for, as Cervantes wrote three and a half centuries ago in *Don Quixote:* "Every tooth in a man's head is more valuable to him than a diamond."

THE CHALLENGE

(Continued from page 194)

ropean ancestors encountered the cultivated crops of the American Indians. Indeed, you can say that the peoples who preceded the Mayans, and those of the Rio Grande Valley, made an enormous step forward when, in America, they domesticated crops that were unknown to the rest of the world. They domesticated maize, which cannot reproduce itself without human help, and this was a tremendous step forward. Indeed, probably there has been no correspondingly big advance in food production since those early prehistoric times, even when we consider crop rotation and farm mechanization.

True, through scientific effort we have improved considerably the vigor and yield of most crops and we now handle and process them much better than in the past. We preserve foods better and, indeed, we now have respect for vitamins. Nevertheless, we still plant essentially the same crops as did our ancestors, and we still eat either a part of plants or feed the plants to animals and then eat the flesh of the animals. This is a very unpleasant description of a good steak, but I am afraid it is the truth.

It seems certain that world problems of food production will inevitably be mitigated by knowledge resulting from intensified studies in the life sciences. I believe we can even dare to hope that such knowledge will give us clues to new kinds of food which can be produced in some other medium than through the growing of green plants in the soil. Perhaps some other form of energy can be substituted for sunlight; possibly other nutrients can be substituted for those that either exist naturally or are artificially put into the soil. Therefore, we should encourage the presently growing interest in the life sciences.

Energy Problems

What about over-all energy requirements? Even for a much larger world population and a substantially increased per capita use of energy, existing fuels, including solar energy (if we may call that a fuel) and uranium, will satisfy our needs for a long time to come, with one exception. At the present time, there seems to be no way to replace the fossil fuels – the oil, natural gas, and coal – for operating mobile power plants on which we depend so much. If you have driven in New York or Los Angeles

(Continued on page 210)

W.E. DEFENSE PROJECTS ENGINEERS are often faced with challenging assignments such as systems testing for the SAGE continental air defense network.

ENGINEERS explore defense frontiers at Western Electric

If guided missiles, tropospheric radio defense communications and airborne radar sound like exciting fields to you, a career at Western Electric may be just what you're after.

Defense projects like these are among our most important assignments . . . and engineers are right in the thick of it. There are the Nike and Terrier guided missile systems . . . advanced air, sea and land radar . . . anti-aircraft gun-control equipment . . . the SAGE continental air defense system . . . DEW Line and White Alice in the Arctic. These and other defense jobs offer wide-ranging opportunities for all kinds of engineers.

Western Electric engineers also discover plenty of made-to-order opportunity in our work as manufacturing and supply unit of the Bell System. Here they flourish in such new and growing fields as electronic switching, microwave radio relay, miniaturization. They engineer the installation of telephone central offices, plan the distribution of equipment and supplies . . . and enjoy, with their defense teammates, the rewards that spring from an engineering career with Western Electric.

Western Electric technical fields include mechanical, electrical, chemical, civil and industrial engineering, plus the physical sciences. For more detailed information pick up a copy of "Consider a Career at Western Electric" from your Placement Officer. Or write College Relations, Room 200C, Western Electric Company, 195 Broadway, New York 7, N. Y. And sign up for a Western Electric interview when the Bell System Interviewing Team visits your campus.

TELEPHONES OF THE FUTURE—Making telephone products for the Bell System calls for first-rate technical know-how. Tomorrow's telephone system will demand even more imaginative engineering.

Western Electric

MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM

Principal manufacturing locations at Chicago, Ill.; Kearny, N. J.; Baltimore, Md.; Indianapolis, Ind.; Allentown and Laureldale, Pa.; Burlington, Greensboro and Winston-Salem, N. C.; Buffalo, N. Y.; North Andover, Mass.; Lincoln and Omaha, Neb.; Kansas City, Mo.; Columbus, Ohio; Oklahoma City, Okla.; Teletype Corporation, Chicago, Ill. and Little Rock, Ark. Also Western Electric Distribution Centers in 32 cities and Installation headquarters in 16 cities. General headquarters: 195 Broadway, New York 7, N. Y.

THE CHALLENGE

(Continued from page 208)

lately, you will appreciate how much we depend on automobiles; and trucks, tractors, and airplanes are also essential parts of our present way of doing things. Except for the biggest of these vehicles, it does not seem to me that nuclear reactors and the use of uranium as fuel are likely to be substitutes for the fossil fuels. In a world competing for fuel, we are going to be in real trouble by the next century, unless we can develop some substitute for fossil fuel for vehicles (in particular the smaller ones); or unless radically different mobile power plants are devised.

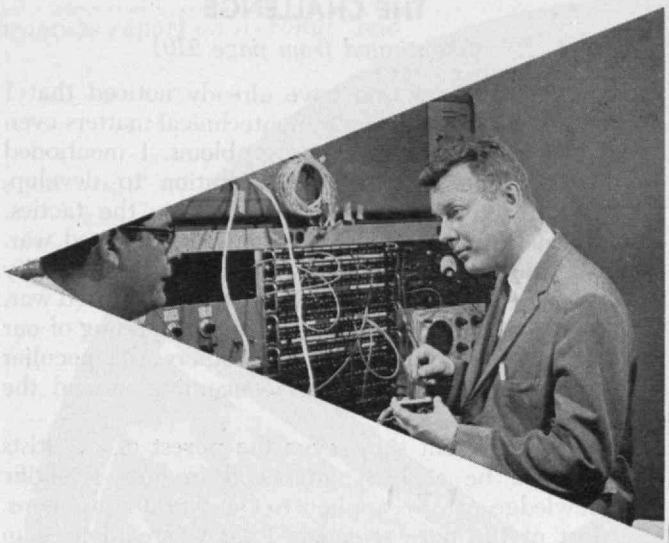
Another problem is raw materials. You remember the Paley report of some years ago which stressed the problem of raw materials – the materials which our industry is already using at an enormous rate. As we go forward with industrialization of the underdeveloped countries, inevitably the rate of use of the world's natural raw materials will again be increased by large factors, and inevitably some natural resources must be expected to become depleted. For example, our present-day supply of iron ore cannot last forever.

We must meet the challenge of materials. One of the last frontiers of physical science is the study of the nature of solid state materials. Solid state physics is one of the last frontiers because it is such a difficult subject. But we must not neglect it because it is difficult. We know that mass-produced metals are much weaker than certain samples of the same metals produced by special processes in the laboratory. If we can discover exactly why this is true, we will be in a position to develop new mass-production techniques for much stronger metals and thus be able to use very much less metal for each application. Less metal for each job will mean more effective use of the world's resources, both for us and for other countries. Therefore, for our welfare as well as for improving relations with other peoples, it is important to emphasize the study of the mechanical – and other – properties of materials in the solid state.

Perhaps enough has been said to make the point. We need science and technology specifically for problems that are related to conservation of the world's raw materials. We need science and technology to make a big step forward in the production and distribution of food. We need science and technology to find a new way to propel motor vehicles, as fossil fuels become more scarce and more expensive. We need science and technology to help maintain our military muscles. Science and technology are necessary not only to deter big war – the war that must never happen – but also to prosecute little wars – that are almost certain to happen if we understand history correctly.

These are my examples, and only *my* examples, of our need for emphasis on science and technology. Others would have a different set of items. No claim is made that this list is complete by any means. But science and technology do not stand alone; truly peaceful coexistence also requires human under-

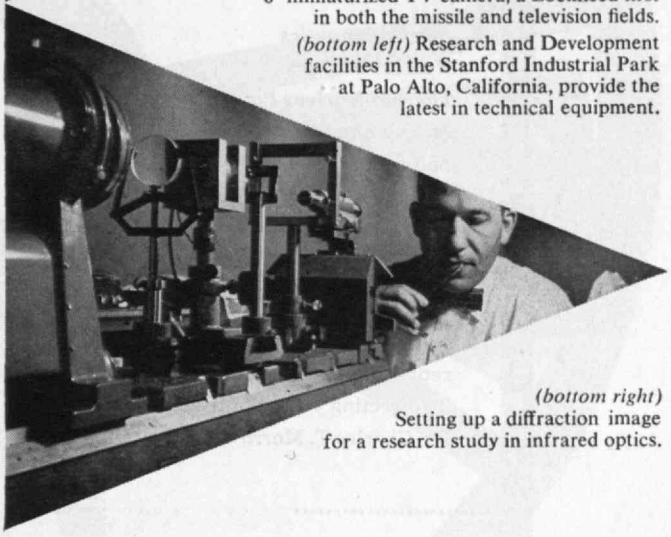
(Continued on page 212)



(top left) Transistorizing missile flight control systems by Lockheed scientists has meant significant reductions in weight and space requirements.

(top right) Monitoring new air-borne 6" miniaturized TV camera, a Lockheed first in both the missile and television fields.

(bottom left) Research and Development facilities in the Stanford Industrial Park at Palo Alto, California, provide the latest in technical equipment.



(bottom right) Setting up a diffraction image for a research study in infrared optics.

EXPANDING THE FRONTIERS OF SPACE TECHNOLOGY

Lockheed Missile Systems Division is engaged in all areas of scientific activity – from concept to operation – in missile and space technology.

Important basic research and development work is being conducted in such fields as advanced systems research; nucleonics; physics; chemistry; mathematics; metallurgy; design; test; electronics; aerothermodynamics; gas dynamics; structures; and astrodynamics. Programs under investigation at Lockheed include: man in space; space communications; space physics; re-entry; ionic and nuclear propulsion; cryogenics; magnetohydrodynamics; oceanography; computer development; noise suppression and damage; materials and processes; boundary layer control; electromagnetic wave propagation and radiation; and operations research and analysis.

The Division is systems manager for such major, long-term projects as the Navy Polaris IRBM; Discoverer Satellite; Army Kingfisher; Air Force Q-5 and X-7 and other important research and development programs.

Headquarters for the Division are at Sunnyvale, California, on the San Francisco Peninsula, and research and development facilities are in the Stanford Industrial Park in Palo Alto and at Van Nuys in the San Fernando Valley. Facilities are new and modern and include the latest in technical equipment. A 4,000 acre Division-owned static test base in the Ben Lomond mountains near Santa Cruz provides for all phases of static field test. In addition, flight test facilities are provided at Cape Canaveral, Florida and Vandenberg AFB, Santa Maria, California.

Scientists and engineers of outstanding talent and inquiring mind are invited to join us in the nation's most interesting and challenging basic research and development programs.

Write: Research and Development Staff, Dept. B-52, 962 W. El Camino Real, Sunnyvale, California; 7701 Woodley Avenue, Van Nuys, California; Suite 745, 405 Lexington Ave., New York 17, New York; Suite 300, 840 N. Michigan Ave., Chicago 11, Illinois.

"The organization that contributed most in the past year to the advancement of the art of missiles and astronautics." NATIONAL MISSILE INDUSTRY CONFERENCE AWARD.

Lockheed / **MISSILE SYSTEMS DIVISION**

SUNNYVALE, PALO ALTO, VAN NUYS, SANTA CRUZ, SANTA MARIA, CALIFORNIA • CAPE CANAVERAL, FLORIDA • ALAMOGORDO, NEW MEXICO

THE CHALLENGE

(Continued from page 210)

standing. Perhaps you have already noticed that I could not help referring to nontechnical matters even in a discussion of technical problems. I mentioned the need for a military organization to develop, through actual long-distance exercises, the tactics, doctrine, capability, and equipment for limited war. I mentioned the political and diplomatic activity which must accompany military action in limited war. I mentioned the widespread misunderstanding of our culture and, in the opinion of others, the peculiar reversal of roles that exists concerning us and the Russians.

At the present time, even the purest of scientists seems to be at least *interested* in how scientific knowledge can be applied to the world's problems. Most of the pure scientists I know are more than interested; they actively encourage or push work on applications of science. They are all keenly aware that the world's problems always involve people. It is important that we keep learning about man himself – man and the way he organizes to do things.

In this connection, Professor Peter F. Drucker, who likes to observe our business society from the detachment of the university campus, has made an interesting observation. He recognizes that America is famed for having developed mass production and that our success in mass production is usually considered to be an engineering achievement involving such concepts as interchangeable parts in mechanical assembly lines. But Peter Drucker thinks that our basic achievement in mass production actually has been an organizational, rather than an engineering, achievement. Our large business organizations have made possible bigger accomplishments and have provided real economic gains. In the same way, large scientific and engineering organizations have been found capable of coping with very large and complex technical problems.

Probably those who have worked in them would have two comments to make regarding large organizations. First, large organizations cannot claim to have been perfected; they still have many problems to solve. Second, despite these problems, the accomplishments of large organizations actually justify Professor Drucker's enthusiasm. Our industrial economy provides evidence of the truth of this last comment.

(Concluded on page 214)

MEN AND IDEAS IN MOTION: AERONUTRONIC

This is Aeronutronic—men, ideas, and the tools for research. Aeronutronic—a dynamic new name in science—created by the Ford Motor Company to meet the demanding technological needs of a nation on the move.

Aeronutronic is moving into the future and moving fast. Space sciences, missile technology and space vehicles...computers, electronics...tactical weapon systems...these are major research, development and manufacturing activities conducted at ASI's modern 200-acre Research Center under construction at Newport Beach, California.

Exceptional engineers and scientists are needed now. If you are forward-looking and want to be an important part of a forward-moving organization, you'll find a new challenge and rewarding future at Aeronutronic—*where men set ideas in motion.*

For information regarding positions, interests, facilities or products, write to Mr. K. A. Dunn, Aeronutronic Systems, Inc., Bldg A10, 1234 Air Way, Glendale, California, or call CHapman 5-6651.

AERONUTRONIC
a subsidiary of FORD MOTOR COMPANY
NEWPORT BEACH, GLENDALE, SANTA ANA AND MAYWOOD, CALIFORNIA

OFFICE OF ADVANCED RESEARCH • SPACE TECHNOLOGY DIVISION • COMPUTER DIVISION • TACTICAL WEAPON SYSTEMS DIVISION

THE CHALLENGE

(Concluded from page 212)

Moreover, it is now well known how successfully scientific creation and engineering excellence can be combined and developed in a large organization. There are examples of this in industry, in Atomic Energy Commission laboratories, and at such institutions as M.I.T.

Laboratory for Human Sciences

Perhaps it would be worth while to experiment with a big laboratory to study and evaluate methods for dealing with some of our long-range human and technical problems. We have here in New Mexico, alone, an organized effort involving about 20,000 civilian and military people who are primarily engaged in the development of military applications of nuclear explosives. Yet nowhere in this country is there a corresponding organized effort on such enormously important problems as food production and distribution, or the impact of industrialization on the peoples of underdeveloped areas.

It is true that we have no assurance that such an attack on long-range peacetime problems would really work, but it seems to me that this matter should be given the most serious consideration. Our challenge is to use our technical resources so that we remain strong not only as a military power, but also as a peaceful civilization.

I believe we have organized the effort to keep us from being involved in the big war. Now is the time to do some positive thinking and take some positive action about limited wars. Both these aspects of our military protection depend heavily on science and technology. They also depend on people and how they are organized to live and work. All of this is also true of the long-range peacetime problems of our society. Our preoccupation with military problems must not prevent us from devoting some of our best resources of people and organizational ideas to problems of peace. Perhaps we can learn how to enlarge and make more effective our attack on problems of peaceful living, by borrowing from our industrial and academic experience in building large creative organizations. This experience with large creative organizations is an important aspect of the over-all strength of our society. It is one of the assets we are using to avoid a military path to extinction. It could well be an important asset in avoiding the Mayan path to extinction.

TREND OF AFFAIRS

(Concluded from page 190)

University of California; and Clyde Kluckholn and Henry A. Murray of Harvard.

Discussions of these essays were written by: Dr. Riesman; David M. Potter of Yale University; Richard M. Bissell, Washington economist; Richard Hofstadter of Columbia University; and Elting E. Morison, Professor of Industrial History at M.I.T., who also edited the book.

COLLEGE ADMISSIONS — I

(*Continued from page 198*)

We have two leading ideas in designing the agenda for this conference: first, instead of inviting principals and headmasters, we seek instead to get the guidance counselor who is on the firing line in terms of advising students about college admission and about higher education in general; second, we avoid propagandizing our visitors, but instead make a point of drawing them out, consulting them, and conducting small discussion groups in which they can raise as many questions and make as many suggestions and criticisms as they wish. We also attempt, in the brief time available, to sketch in a general way the educational objectives and methods of M.I.T.

Partly because these visitors have so many interests in common, and partly because they see each other so seldom, they find these conferences of great help and interest, and go away full of enthusiasm. There seems to be no substitute for getting people actually here and into the M.I.T. atmosphere for a couple of days in order to convey to them what the Institute is really trying to do. One feature of the program is to have M.I.T. undergraduates from each of the secondary schools act as hosts at lunch for the counselors from their respective schools. In this way, the important objective is met of having the school representative get a first-hand impression of how his students are getting along without the information going through any M.I.T. intermediary.

(*Concluded on page 218*)

COLLEGE ADMISSIONS — I

(*Concluded from page 216*)

The fourth and most important of the major agencies involved in broadening the admissions process is the Educational Council. This body of over 700 Alumni, many of them very experienced and all enthusiastic and loyal, has made a contribution of incalculable value to M.I.T. and to the broad problem of educational guidance in the United States. There is no substitute for an informed group at the grass roots who are always available locally and in contact with the individual schools. The 1,200 high schools which are in direct touch, each with a member of the Council specifically assigned to it, have had good reason to appreciate the splendid work carried on by these men.

In the Council's work, as in the visiting program, the schools are reassured by the educational guidance approach and by the absence of recruiting and competitive tactics. It is a valuable privilege for a student at a distance to be able to talk to someone who has actually passed through the M.I.T. educational process and can convey to him at first hand some sense of what this is about. It is likewise of the greatest help to the Admissions Office to have the comments of an Alumnus, in whose judgment we have confidence, about a student on whom we have otherwise only paper evidence.

The Educational Council has, to a considerable extent, set a standard and an example for similar efforts in other institutions. Its chief merit lies in its genuine educational approach, in contrast to the kind of shortsighted recruiting efforts which have so often aroused hostility in the high schools. While we are very anxious that a candidate should have a complete knowledge of M.I.T., so far as this is possible, so that he can make an intelligent selection, we feel that a candidate who comes here solely because of heavy selling pressure is seldom a good risk. We want him to make his own decision with full knowledge of the alternatives open to him.

Part II of Professor Thresher's article will appear in the March issue of The Review. In his concluding article, Professor Thresher will discuss methods used in the selection of students, danger signs to be heeded, and some of the current practices and problems in the field of college admissions. – Ed.

PROFESSIONAL CARDS

JACKSON & MORELAND, INC.
JACKSON & MORELAND INTERNATIONAL, INC.
Engineers and Consultants

ELECTRICAL—MECHANICAL—STRUCTURAL
DESIGN AND SUPERVISION OF CONSTRUCTION
FOR
UTILITY, INDUSTRIAL AND ATOMIC PROJECTS
SURVEYS—APPRAISALS—REPORTS
MACHINE DESIGN—TECHNICAL PUBLICATIONS

BOSTON NEW YORK

EADIE, FREUND & CAMPBELL
CONSULTING ENGINEERS

500 FIFTH AVENUE NEW YORK 36, N. Y.

Mechanical—Electrical—Sanitary
Air Conditioning—Power—Process Layouts

James K. Campbell '11

METCALF & EDDY
Engineers

Water, Sewage, Drainage, Refuse and
Industrial Wastes Problems
Airports, Laboratory, Valuations
Statler Building, Boston 16, Mass.

THE KULJIAN CORPORATION
Consultants • Engineers • Constructors

UTILITY • INDUSTRIAL • CHEMICAL

Power Plants (Steam, Hydro, Diesel), Textile Plants,
Water & Sewage Works, Oil Refineries, Pipe Lines,
Army & Navy Installations, Air Fields, Hangars

H. A. Kuljian '19 A. H. Kuljian '48
1200 NO. BROAD ST., PHILADELPHIA 21, PA.

FABRIC RESEARCH LABORATORIES, INC.

Research, Development, and Consultation
In the Fields of Fibrous, Organic, and Related Materials

1000 Providence Highway Dedham, Mass.
(At Route 128 and U.S. 1 Interchange)

W. J. HAMBURGER, '21 K. R. FOX, '40 E. R. KASWELL, '39

GILBERT ASSOCIATES, INC.
ENGINEERS AND CONSULTANTS

Malcolm G. Davis '25, *Vice President*
Allen W. Reid '12 E. C. Edgar '35

Steam, Hydro, Diesel, Nuclear Power Plants; Industrial Structures; Plant Safety, Utility Rates, Valuations, Reports; Purchasing; Chemical Laboratory

New York • READING, PA. • Washington

LAUREN B. HITCHCOCK ASSOCIATES
Chemical Engineers

Industrial Research & Development
Technical & Economic Evaluations
Acquisitions of Processes and Plants
Commercial Chemical Development—Air Pollution Control

Lauren B. Hitchcock '20 Technical Advisor, John H. Schaefer '26
60 East 42nd Street ..... New York 17, N. Y.

FAY, SPOFFORD & THORNDIKE, INC.
Engineers

Airports, Bridges, Express Highways
Water Supply, Sewerage and Drainage Systems
Port and Terminal Works
Industrial Plants Incinerators

Designs Investigations
Supervision of Construction

Boston, Massachusetts

CLEVERDON, VARNEY & PIKE
Consulting Engineers

HERBERT S. CLEVERDON '10 WALDO F. PIKE '15
JOHN A. DOW '23 HAROLD E. PROCTOR '17

Structural Designs Foundations
Heating, Ventilating, Electric and Plumbing Designs, Industrial Buildings, Reports, Investigations

120 TREMONT STREET BOSTON 8, MASS.

MAURICE A. REIDY
Consulting Engineer

BRIDGES BUILDINGS
STRUCTURAL DESIGNS FOUNDATIONS
CONSTRUCTION CONSULTANT AND ARCHITECTURAL ENGINEER

Estimates and Appraisals

101 TREMONT STREET BOSTON, MASS.

CHARLES NELSON DEBES AND ASSOCIATES
ENGINEERS AND ARCHITECTS

Structural, Electrical, Mechanical, Acoustical
Industrial, Commercial and Municipal Projects

915 EAST STATE ST. ROCKFORD, ILL.
C. N. DEBES '35

MORAN, PROCTOR, MUESER & RUTLEDGE
CONSULTING ENGINEERS

Foundations for Buildings, Bridges and Dams;
Tunnels, Bulkheads, Marine Structures, Soil Studies and Tests; Reports, Design and Supervision

WILLIAM H. MUESER '22 PHILIP C. RUTLEDGE '33
415 Madison Ave., New York 17, N. Y.

BREWER ENGINEERING LABORATORIES
Consulting Engineers

Electric Strain Gage Testing • Stress Analysis
Strain Gage Amplifiers • Strain Gage Switches
High Temperature Strain Gages

MARION, MASS. TEL. 103
G. A. Brewer '38 S. P. Cammack '57

CAPITOL ENGINEERING CORPORATION
CONSULTING ENGINEERS

DILLSBURG, PENNSYLVANIA

Highways
Airports
Water Supply
Sewage Treatment
Bridges

Reports
Surveys
Design
Construction Supervision
Soil Testing

Branch Offices

Rochester, N. Y. Saigon, Vietnam
Robert E. Smith '41, Vice President

ALUMNI AND OFFICERS IN THE NEWS

Shifting Gears . . .

In addition to the 20 on page 184, other Alumni have received appointments, elections, and promotions as follows:

CHESTER M. RUNELS'15 as manager, real estate department, City Institution for Savings, Lowell, Mass. . . . HOWARD F. RUSSELL'23 as a director, Westchester County Association . . . EDWIN E. SPITZER'26 and CLAIRE C. SIMERAL, JR., '49 as manager, power tube operations and manager, microwave tube operations, respectively, Electron Tube Division, Radio Corporation of America;

MAX I. ALIMANSKY'28 as manager, General Electric distribution transformer department high voltage specialty plant, Holyoke, Mass. . . . GEORGE E. WHITE'29 as assistant general manager, operations, Birds Eye division, General Foods Corporation . . . JOHN M. HOLLYWOOD'31 as president, Connecticut subsection, the Institute of Radio Engineers;

ERMANO GARAVENTA'35 as factory manager, Hamilton Standard division, United Aircraft Corporation . . . HOMER R. OLDFIELD, JR.,'38 as assistant manager, government equipment division, Raytheon Manufacturing Company . . . ROBERT S. HARPER'40 as a director, Associated Industries of Massachusetts;

JAMES B. REA'40 as special assistant to the president, Aeronutronic Systems, Inc., subsidiary of Ford Motor Company, Glendale, Calif. . . . JAMES F. MCCLELLAND, JR.,'42 as manager, Production Engineering Department, Rockbestos Products Corporation, New Haven, Conn. . . . THOMAS E. PEACOCK, JR.,'43 as marketing manager, Exide Industrial Division, Electric Storage Battery Company;

CARROLL W. BOYCE'44 as editor, *Fleet Owner,* publication of the McGraw-Hill Publishing Company . . . ROBERT K. MCCANDLISS'47 as chief naval architect, Electric Boat division, General Dynamics Corporation . . . FREDERICK J. MCGARRY '50 as a member, executive board, Society of Aircraft Materials and Process Engineers—Eastern Division . . . PETER W. PLUMLEY'50 as assistant actuary, Life Actuarial Department, Travelers Insurance Company, Hartford, Conn.

Print Time Nears . . .

Below described are books by Alumni and staff members which have recently been or will shortly be published.

Allocation of T. V. Channels is the report of the *ad hoc* advisory committee on allocations to the Committee on Interstate and Foreign Commerce, United States Senate. EDWARD L. BOWLES'22 wrote the report; WILLIAM B. LODGE'30, A. EARL CULLUM, JR.,'31, and DONALD G. FINK'33 were members of the advisory committee. (Washington, D.C.: United States Government Printing Office, 1958, 266 pages.)

Editor of *Random Vibration, Notes for the M.I.T. Special Summer Program, June 23 through July 3, 1958,* is STEPHEN H. CRANDALL'46. The notes are an introduction to the random vibration problem important in recent years in the design and testing of missiles, jet aircraft, and other vehicles subject to random loadings. (New York: The Technology Press of M.I.T. and John Wiley and Sons, Inc., 1958, 406 pages, $10.00.)

The Scanlon Plan, a compilation of articles describing a unique union-management co-operation program, is edited by FREDERICK G. LESIEUR, Lecturer in Economics, with contributions by DOUGLAS M. MCGREGOR, Professor of Industrial Management; GEORGE P. SHULTZ'49; ELBRIDGE S. PUCKETT'56; and others. (New York: The Technology Press of M.I.T. and John Wiley and Sons, Inc., 1958, 173 pages, $4.50.)

An M.I.T. Department of Architecture study directed by MARVIN E. GOODY'51 is outlined in the report, *Building with Plastic Structural Sandwich Panels,* edited by BERNARD P. SPRING'51. The study defines the status of plastic structural sandwich panels and explores their architectural potentialities. (Springfield, Mass.: Monsanto Chemical Company, 1958, 116 pages, $3.00.)

Theory and Methods of Scaling is a comprehensive survey of the various theories and methods of psychological scaling, by WARREN S. TORGERSON, Lincoln Laboratory. (New York: John Wiley and Sons, Inc., 1958, 460 pages, $9.50.)

"A political scientist's lively bird's-eye view of the areas where one of every four Americans now live" is *Suburbia: Its People and Their Politics* by ROBERT C. WOOD, Assistant Professor of Political Science at M.I.T. (New York: Houghton Mifflin Company, 1959, $4.50.)

Counting Years . . .

Among the Alumni observing birthdays during February are HARRY C. PARKES'92 who will become 90 on the 17th; six who will become 85; and twelve who will become 80, as listed below with dates of birth:

February, 1874 — JESSE M. HOLDER '94 on the 9th; FRED B. OWEN'96 on the 11th; C. WILLARD BIGELOW'95 on the 16th; BENJAMIN C. TRIPP'97 on the 19th; E. M. BRAGG'96 on the 22d; and CHARLES R. CURRIER'97 on the 27th.

February, 1879 — FRED I. TUCKER'00 on the 2d; MRS. GEORGE H. HAMILTON'03 and WILL G. KELLEY'01 on the 8th; ASHTON C. PERSONS'01 on the 9th; WILLIAM D. CROWELL'02 on the 10th; HAROLD H. DAVIS'02 on the 11th; NATHANIEL K. B. PATCH'01 on the 15th; WILLIAM C. FURER '06 on the 18th; ARCHIBALD H. BRIGGS'02 on the 20th; F. MINOT BLAKE'99 and NATHANIEL D. RAND'00 on the 21st; and JOHN W. SHAW'04 on the 22d.

Including these 19, there will be a total of 77 nonagenarians and, in addition, 743 octogenarians on the rolls of the Alumni Association.

Obituary

ALPHEUS W. CHITTENDEN'89, October, 1958
WALTER E. HOPTON'91, October 20†
HERBERT R. FITCH'92, November, 1958*
JOSEPH P. LYON'92, October, 1958*
HORATIO W. BURCKHARDT'93, no date given
EDWARD W. ABELL'94, 1957
THEODORE HORTON'94, December 7*
NATHANIEL H. MORISON'94, November, 1957*
WARREN H. BARNES'97, July 3
PAUL B. WESSON'98, August 14
JOHN C. GREENLEAF'99, January 18, 1958
CARL S. MILLIKEN'99, November 19
DONALD A. KOHR'01, June 14
BARTHOLD E. SCHLESINGER'01, December 15
BENJAMIN F. C. HAANEL'02, April 24*
LYNCH LUQUER'03, September 22, 1957
EMMOR H. MILLARD'03, October 28*
ARTHUR F. BELDING'05, September 29
RENSHAW BORIE'05, July 1
WALTER BURNS'05, November 5*
MRS. C. S. MADDOCK, JR., (ELIZABETH H. MIDDLETON)'05, November 3*
HARRY M. NABSTEDT'05, December 8
HAROLD V. O. COES'06, December 4*
JOHN H. LINK'07, October 31*
HOWARD H. MCCHESNEY'07, December 7
BRYANT NICHOLS'07, January 9
PHIFER SMITH'09, November 3*
OWEN D. EVANS'10, July 17
LOUIS W. WALZ'11, August 23, 1956*
FREDERICK W. BARKER'12, December 10
A. C. CARLTON'17, November 12*
THEODORE E. STAHL'17, December 4
WILLIAM J. FARRISEE'19, November 30*
MRS. GUSTAVE M. WEIL (ELLEN E. WILLIAMS)'19, 1957
RICHARD C. POOLE'21, June 14*
DAVID J. ABRAHAMS'22, November 17*
WILLIAM S. BRACKETT'23, January 8
STEPHEN R. KIEHEL'23, February 21, 1958
MARSHALL S. SIMPSON'23, November 29
ARTHUR W. GRAVES'24, November 17
WILLIAM W. SCRIPPS'25, November 10
FREDERICK WINSOR, JR.,'25, November 26*
CHARLES T. SHEA'26, September 30*
CHARLES E. TONRY'26, December 21
WILBUR H. ADAMS'28, November 6
SAMUEL A. GORDON'29, October 26*
NORMAN F. O'SHEA'30, November 24
WILLIAM R. SPANN'32, no date given
MRS. FRANK W. CARPENTER (MARIA W. BATES)'33, November 17
EARLE D. MCLEOD'33, November 15
HOWARD TATEL'35, November 15, 1957
CHARLES N. ENDWEISS'36, September, 1958
ARTHUR W. BARRY'37, November 6
HARRY T. FINN'38, February 4, 1954*
FRANK J. O'NEIL'40, November 29
STANLEY A. KORYLAK'50, October 21*
JOHN G. BOLMAN'55, September 9*
LAWRENCE WONG'55, September 24, 1957
LEWIS W. DUNHAM, JR.,'56, December 1*

*Further information in Class Notes.
†See M.I.T. Club of Central New York.

CLUB NOTES

Central Massachusetts

Our second meeting of the year was held at the Mount Pleasant Country Club in Boylston. As it was the first time that many of us had the opportunity to visit this new country club, we were indebted to the program chairman, Mac Levine'25, for arranging for this ladies' night. Although the temperature outside was approaching the zero mark, inside we all enjoyed a wonderful warm evening in the relaxing atmosphere of pleasant surroundings, excellent food, and old friendships.

Herbert Hayden'23 and Mrs. Hayden were on hand with their fine movies and slides of Alaska. The scenery, points of interest, and events which they captured on film were thoroughly enjoyable. Herb gave a running commentary on the pictures, which helped us all get a clear and vivid idea of the new 49th state.

President's Night, featuring M.I.T.'s newly elected President, Dr. Julius A. Stratton'23, will be held March 19 at the Bancroft Hotel. Dr. Stratton will speak about the responsibilities of M.I.T. within the educational system of this country, both on the level of higher education and the integration of science teaching on the secondary school level.

Plans are now under way to make this the biggest affair that this club has ever undertaken. We hope to have a splendid turnout of educational and civic leaders to meet Dr. Stratton, in addition to the M.I.T. Alumni of Central Massachusetts. The whole executive committee of the club is assisting to make the meeting, which will also be a ladies' night, a complete success. President Robert Dawes'26 is the program chairman. — IRVINE F. WILLIAMSON'50, *Secretary,* 21 Eastwood Road, Shrewsbury, Mass. HARRY B. DUANE'57, *Assistant Secretary,* 15 Algonquin Road, Worcester, Mass.

Central New York

It is with regret that we must announce the death of one of the founders of the M.I.T. Club of Central New York. Walter E. Hopton'91, who died on October 21, 1958, after several years of illness, helped to found the club in 1907. As a result of his illness he has been unable to take part in the activities of the club in recent years, but those of us who remember him will miss his guidance and counsel.

On November 18 members of the M.I.T. Club and the Air Force Association together with their wives and guests went to Griffiss Air Force Base at Rome, N.Y. There we were all guests of Colonel Emmett Tally, who entertained us with a social hour and fine dinner at the officers' club. Following the dinner, Colonel Tally described the physical facilities of the base as well as its mission in the Air Force. Most of us were quite impressed with the number of miles of runway and roads which had to be plowed out during the winter months to keep the base operational, since several squadrons of jet fighters of the Air Defense Command are based there and they must be able to respond rapidly to any alert. He also showed us a film on the logistics involved in keeping missiles operational at the various bases throughout the country.

Before we left for the flight line in busses, one of the officers of the fighter squadrons demonstrated the equipment which a pilot must wear when he takes off on a flight. The Air Force certainly gives its flying personnel everything that it possibly can to assist them in survival if they are forced to leave their plane. On the flight line we stood along the taxi-way while two jet fighters took off on a practice scramble. The planes are kept in sheds to facilitate starting in bad weather, and then they taxi to the runway to take off with a pencil of flame spewing out the tail pipe from the afterburner and a mighty roar.

Members of the club who attended were: R. W. Ayling'44, G. A. Bruno'39, S. W. Evans'47, E. C. Finnegan'51, G. G. Gebert'50, F. P. Hall'21, W. H. Hartford'30, J. H. Hartnett'55, J. H. Holton '17, R. P. Holton'57, F. S. Hungerford'24, M. Masnik'41, J. M. McGrew'54, R. Monsen'57, E. L. Moyer'44, D. J. Sandell '49, W. R. Schuler'32, D. G. Traver'45, and A. G. Wheler'52. Unfortunately our president Alden West'44 got weathered in in Boston and was not able to attend, but he was ably represented by his wife. — PAUL B. OSTERGAARD'49, *Secretary-Treasurer,* 111 Sherbrooke Road, East Syracuse, N.Y.

Chicago

Future members of the Class of 1962 from the Chicago area were guests of the officers and directors of the M.I.T. Club of Chicago on Wednesday evening, September 3, at a smoker held at the University Club. Fathers of the entering freshmen, as well as present undergraduates from the Chicago area, were also invited.

Bob Faurot'44, President, welcomed the young men and explained that the purpose was to provide them with an opportunity to meet with each other and with undergraduates and to permit them to ask any questions about Tech or Tech life. Further, the event was to provide the fathers with an opportunity to meet other fathers, undergraduates, and Chicago Alumni. About 30 freshmen, 45 undergraduates, 20 fathers, and 15 club members were present.

Phil Coleman'23, head of the Chicago Educational Counselor group; Hal Davis '40, Vice-president; and Bob Silberman '48, Treasurer, made the arrangements. Carl Swanson, Class of '60, sparked the Alumni into giving the event.

The smoker received enthusiastic response and was considered very successful. The directors plan to recommend a similar program for next year and wholeheartedly urge other Alumni groups and associations to consider a similar program for their areas.

The second event took place on Saturday, September 27, when our cruise along the lake front to Calumet Harbor, SAG Channel and the Chicago River, which was so successful in 1956, was repeated. Dutch Seifert'19 was program chairman. About 57 Alumni, wives, and guests took the cruise, which lasted all day. Coffee and rolls were available for those who missed breakfast and a box lunch was served during the trip. The trip offered an unusual view of Chicagoland which most of us had not seen before. Everyone enjoyed himself immensely and all thanked Dutch for his efforts.

Our third event took place on Saturday, November 15, at the Furniture Club. This was a most informative conference on the subject of the Physical Science Study Committee that has been operating at the Institute, developing new high school science curricula with the sponsorship of the Ford Foundation and the National Science Foundation. Our key speakers of the day were Professor Jerrold Zacharias, Director of P.S.S.C., and Dr. Elbert P. Little, Executive Director of the project. Others who spoke briefly were Professor Gunther Schwartz, of the University of Florida, and Dean Gilbert C. Finlay and Professor David Page of the University of Illinois, each of whom has been attached to the P.S.S.C.

These gentlemen all presented the background and activities of the project, and some practical experiences in teaching the new high school physics curriculum were discussed by Mr. Robert E. Anspaugh of the Evanston Township High School and Mr. Herman Ryder of Maine Township High School.

The Club was fortunate in having a turnout of over 130, including as guests 80 high school teachers, counselors, and administrators from Chicago and suburban high schools. A lively questioning period following the formal program indicated the interest of these guests in the work on secondary school teaching being carried out at M.I.T.

Bob Faurot opened the meeting, and Phil Coleman spoke briefly as did Mr. Hugh Darden, who is in charge of the Educational Counselors for the Institute. We were very pleased to have such a fine turnout from Cambridge, which materially strengthened our program. — JOHN T. SHUTACK'43, *Secretary,* Booz-Allen and Hamilton, 135 South LaSalle Street, Chicago 3, Ill.

Cleveland

The Cleveland M.I.T. Club's first meeting, the annual fall beer party in October,

was a huge success. The large gathering was treated to a wonderful buffet dinner, everyone caught up on the summer happenings, and as usual M.I.T. songs, rendered lustily, were heard to all hours of the night.

The second meeting will be the annual Christmas luncheon on December 30, at the University Club. As is our custom, M.I.T. students and Faculty from the Cleveland area who are home for the holiday will be our guests and bring us up to date on affairs and activities at M.I.T. This year we will be particularly fortunate to have with us Joseph E. Conrad from the Alumni Fund Office. We expect this luncheon to be as successful as similar meetings in the past and hope that all M.I.T. Alumni in Cleveland will be with us.

At the last executive committee meeting plans were made for three meetings during the first half of 1959. On January 29 the Club is scheduled to hear either John Burchard'23, Dean of Humanities and Social Studies, or Dr. Carl Overhage, Director of M.I.T.'s Lincoln Laboratory. Both men will be passing through Cleveland on their way to the Detroit regional conference. The second meeting is planned for the last part of March or the first of April, and several outstanding speakers are being invited. Our annual ladies' night meeting is tentatively scheduled for late May or early June and will be highlighted by an excursion trip up the Cuyahoga River and dinner at Captain Franks' East 9th Street Pier Restaurant. — HEATH OLIVER'55, *Secretary*, Bardons and Oliver, Inc., 1133 West 9th Street, Cleveland 13, Ohio.

Fairfield County

The M.I.T. Club of Fairfield County held its fall dinner meeting at the Clambox in Westport, Conn., on Tuesday, November 6, 1958. Dr. Elbert P. Little, Executive Director of the Physical Science Study Committee, described the course in physical science that the committee is developing for use in the secondary school. He also presented a number of interesting demonstrations that are designed to encourage the student to discover the basic physics concepts through experiments.

Along with 20 guests, the Alumni attending were: G. A. Bradley'52, D. L. Botway'49, J. B. Chapman'35, A. J. Chenis'38, A. M. Cohen'36, E. W. Crouthers'55, T. B. Curran'29, C. P. Epifano'39, F. F. Ferrary'37, W. P. Fiske '54, M. A. Fitzgerald'54, J. E. Fitzgerald '55, R. W. Gaines'39, R. Goff'51, E. P. Hempstead'34, T. H. Kazanjian'31, R. T. Kasal'53, N. H. Kreisman'48, D. J. Lovell '45, H. R. McCue'52, B. N. Nowitz'55, H. Ottinger'43, G. E. Power'41, H. D. Pickering'50, A. R. Savina'30, E. W. Smith'42, S. R. Spiker'25, C. H. Springer '45, L. Steffens'30, R. Swain'33, D. F. Tarinelli'52, H. M. Tepper'52, R. B. Thompson'32, J. R. Vyce'52, D. W. Waterman'39, M. L. Waterman'13, G. R. Weppler'37, J. B. Williams'47, E. M. Wormser'42, and Abraham Zimmer'39. — ELMER W. CROUTHERS'55 *Secretary*, 152 Norman Circle, Stratford, Connecticut.

Kansas City

The M.I.T. Club of Kansas City met for a dinner meeting on November 25. A cocktail and social hour preceding the meeting gave members a chance to renew acquaintances and the members who were attending the meeting for the first time an opportunity to become acquainted.

The M.I.T. Club of Kansas City recommended that Dick Wheeler'25 be listed as a candidate for the national nominating committee of the M.I.T. Alumni Association. John T. Murphy'37, a prominent Kansas City architect, talked to the group on the subject of "KC-80." This was a talk on the plans and possible development of the downtown area of Kansas City projected to the year 1980. John Murphy has worked closely with the planning commission of the city of Kansas City and was able to give an informative presentation with slides, which was of interest to all the M.I.T. Alumni and their guests. Members of the M.I.T. Club who attended with their wives were: Bob Cadieu'48, Ed Cote'47, J. Warren Evans'39, Phil Gruber'25, B. L. Hakan'42, Nate Koch'57, Fred Lehmann'51, John T. Murphy'37, William H. Peiler'43, L. L. Robinett'36, D. H. Stearns'53, and Dick Wheeler'25. Also attending were D. H. Hyde; Art Kaaz, Jr.,'56; and Ray Starr'23. — B. L. HAKAN'42, *Secretary*, 1708 Campbell Street, Kansas City, Mo.

New Mexico

At a luncheon meeting December 11 the M.I.T. Club of New Mexico voted unanimously to ratify the action of the Alumni Association in declaring Mr. F. J. Given'19 "Mr. M.I.T. of New Mexico" at the recently held regional conference in Albuquerque. It was decided that a donation from the proceeds of the conference be sent to M.I.T. for use in scholarships. A gift to signify our thanks to Dr. Phillips of Los Alamos, one of the conference speakers, was also voted. Any further surplus from the conference will be used for educational purposes. — JULIAN E. GROSS'50, *Secretary-Treasurer*, 1208 Florida Street Northeast, Albuquerque, N.M.

New York

Approximately 150 members, guests, and wives attended the annual Silver Stein Award Dinner in the Bowman Room of the Biltmore Hotel on November 18, 1958.

The Silver Stein was awarded to Thomas D'Arcy Brophy'16, by E. P. Brooks'17, Dean of the School of Industrial Management at M.I.T. Following the award Dean Brooks introduced Dr. John W. Gardner, President of the Carnegie Corporation of New York and the Carnegie Foundation for the Advancement of Teaching. Dr. Gardner spoke interestingly but briefly on some facets of our educational system, stressing the need to cherish and foster excellence at all levels of endeavor, the need to develop men with a sense of leadership's obligations to the nation, and the need to set ourselves high goals and be our own task masters.

After receiving the award Mr. Brophy gave an excellent talk on the theme of deteriorating relationships of the United States with other free world countries. He pointed out that the achievements of the communist nations in lifting themselves technologically by their own bootstraps are news in underdeveloped areas, whereas our nation, having achieved far greater accomplishments, has not capitalized on these achievements in their dealings with peoples in underdeveloped areas. Mr. Brophy went on to point out that the fault seems to be educating our emissaries to these areas in the techniques of "putting America over."

At this writing we look forward to hearing Associate Dean Howard W. Johnson at the technical seminar scheduled for January 15, 1959. John B. Calkin'32 is chairman for this occasion and James Margolis'52 is handling the arrangements. Additionally, we are looking forward to a very interesting annual technical dinner on February 5, 1959, at which Dr. C. Stark Draper'26, Head of the Aeronautical Engineering Department at M.I.T., will moderate a panel discussion on "The Conquest of Outer Space." You will hear more of these events in future issues of The Review.

Dues payments have been received from many members for the 1958-59 fiscal year during the past month. We must hear from more if the Club is to achieve a balanced budget this year.

At this printing, the M.I.T. membership directory for 1958-59 is in the process of printing. Distribution to the membership is scheduled for early January. — VERNON O. BOWLES'33, *Secretary*, Holly Ridge Farm, Katonah, N.Y.

Oregon

On Friday, December 5, 50 members of the M.I.T. Club of Oregon met for the annual fall meeting. The meeting was held at the new Oregon Museum of Science and Industry. Mr. J. Peter Anderson, Assistant to the Director of Admissions, spoke to the club, after which the members toured the museum and had a special planetarium show. This club has had the pleasure of submitting in nomination the name of our member Mr. E. Robert deLuccia'27 for the District #10 vacancy, on the national nominating committee. — MALCOLM A. BLANCHARD'36, *Secretary-Treasurer*, 2546 Southwest Vista Avenue, Portland 1, Ore.

Schenectady

Diamonds, man-made at General Electric Company Research Laboratory, were the topic of guest speaker Dr. H. M. Strong at the Schenectady Club's first luncheon meeting. This was an excellent presentation with as much nonconfidential information on the subject as could be crammed into the brief period following the main dinner course. Dr. Strong's lively manner brought to life the problems encountered in such accomplishments as making diamonds from peanut butter. He pointed out that the process has yet to be reversed.

That meeting was in October. September had seen 30 staunch picnickers and

12 of their children refuse to be rained out of the club's annual steaknic (a charcoal steak roast affair now almost a tradition). Postponing once during the very rainy month, we didn't want to hold out indefinitely for the exactly right day; so we chose the exactly wrong one. We felt vindicated in holding to our plan since similar weather followed for over a week. Russ'50 and Marty Pflasterer, the couple heading up the arrangements, were pleased at the spontaneous *esprit de corps* which defied the elements and held the group 'til dark. At the November luncheon meeting "Whys and Wherefores of Today's Stock Market" were discussed by Mr. Bernard Segel of Schenectady's brokerage firm, Bache and Co. His interpretation of this very inexact science sparked a lively discussion period.

A rather special event was made of the December luncheon. As executive secretary, Mr. D. Hugh Darden travels much for the Educational Council of M.I.T. and was willing to take in Schenectady at this time. Mr. Darden had an important message, since by and large the Alumni do not know much about the Council. He described its growth, present status, and plans for the future. We trust that some of his enthusiasm rubbed off onto some of the other club members. His presentation was most interesting as evidenced by the discussion period which followed. We left convinced that the Council has a very significant function in bringing to the high school student sincere and informative counseling for his future in higher education.

The many aspects of nuclear energy will be tapped for topics of future meetings. Luncheon meetings are planned for January, March, and April. The annual dinner meeting will be held toward the end of January and a meeting on civic affairs in the spring. Club officers this year are John R. M. Alger'49, President; Burt Angell'43, Vice-president; Earl Reiback'56, Treasurer; and your reporter DAVID M. DENZER'46, *Secretary,* Lake Hill Road, Burnt Hills, N.Y.

Switzerland

The number of M.I.T. Alumni residing in Switzerland is not large; but your Honorary Secretary thought it would be a good idea to try to get those residing in Zurich together, for a start, and see how many would respond. On November 21, a first get-acquainted dinner and chat was held in one of our typical Swiss wayside inns — formerly an old mill.

There were six of us, namely: H. C. Bechtler'27, R. A. M. Huber'37, Dr. E. A. Mueller'51, Professor M. Rauscher'26, Dr. F. Schnorf'52, and W. Schoop'22. Each one gave an account of his doings since leaving M.I.T. A pleasant time was had by all, so that the experience will be repeated in due time; and, if attendance warrants it, the get-together dinner may in time become a regular event. — WERNER SCHOOP'22, *Honorary Secretary,* Scheideggstrasse 68, Zurich, Switzerland.

Virginia

The M.I.T. Club of Virginia met at the Commonwealth Club in Richmond on Friday, November 21. Approximately 40 members and wives were present. Dr. Allan T. Gwathmey'28, Professor of chemistry at the University of Virginia, gave an interesting talk on "Crystallography and the Industry of the Future." Dr. Gwathmey made an earnest plea for the support of such fundamental sciences as crystallography. The information gained from these fundamental sciences contributes much in the over-all understanding of everyday phenomena.

Mr. Christian E. Grosser'32 was introduced as the new member of the Richmond area M.I.T. Educational Council. — CARSON L. BROOKS'35, *Secretary,* Assistant Director, Reynolds Metals Company Metallurgical Research Laboratories, Fourth and Canal Streets, Richmond, Va.

Women's Association

On December 9 the Women's Association held a dinner meeting at the Faculty Club. The graduate women students at the Institute had been invited and 10 of them attended the meeting.

After dinner the president, Frieda Cohen'45, welcomed the graduate students, briefly outlined the aims of the association, and invited them to join.

Janet Perkins'52, program chairman, announced that our next meeting, which will be a luncheon meeting on February 14, will feature foreign women students at M.I.T.

The speaker of the evening was introduced by Dorothy Weeks'23. Dr. Cecilia Payne-Gaposchkin, Philips Astronomer at Harvard University, spoke on "The Rewards of Research." Her talk was especially directed to the graduate students who are about to choose a research project. A lively question and answer period followed. — ANNA BAILEY'54, *Recording Secretary,* 61 Columbia Street, Brookline 46, Mass.

CLASS NOTES

1891

This letter, which comes to the Class from the wife of Robert Ball, 60 Storey's Way, Cambridge, England, is of real interest to all members of our Class, for Robert Ball has been our personal connection with Cambridge University, England; and what a staunch and able friend we have had! Robert, always loyal to M.I.T. and the Class of 1891, the best correspondent in the Class, kept us informed regarding that great center of learning and culture of which he is a part. It was graduates of Cambridge England, that mother of learning and enlightenment, who brought to New England not alone the name of our Massachusetts city of learning but the seeds of democracy and of human liberty which we so deeply venerate.

Now, here is the letter: "Dear Mr. Brown, Your letter to my husband Robert Ball of June 2 should have been answered long before this. He very greatly appreciated receiving it with its warmth of greeting. He holds Tech in great affection and loves to recall his time there and his happy association with his classmates of '91. Alas, he is in a very frail state of health and has had several weeks in a nursing home recently. His memory now is poor for passing events, and letter writing is too much of an exertion for him to undertake. I know he hopes to answer your welcome greeting of June 2; but in case no word reaches you from him, I felt I would let you know the toll his 88 and a half years have taken of him. Any news of your gathering of the 16th and of those present would give him great pleasure if you had leisure to send it to him. With warm greetings from Mrs. Robert Ball."

And now, we wish to express to you, Robert and Mrs. Ball, our deep and abiding affection and regard. The limitations of age are upon us all, more or less, but our memory and affection do not flag nor fade away. You two hold a rather special place of honor among us, and you always will. — WILLIAM CHANNING BROWN, *Secretary,* 15 Forest Avenue, Hastings-on-Hudson, N.Y.

1892

The Secretary is sorry to have to report the death of two more classmates, Joseph P. Lyon and Herbert R. Fitch.

Lyon died in October at his home in Norwich, Conn. He graduated with us in Course I, and the Secretary recalls the pleasant summer we spent together in 1892 in the drafting room of the Johnson Company, Johnstown, Pa. Shortly afterward Lyon established his own drafting business in Connecticut and through all his active life was engaged in that work.

Fitch died in November at his home in San Diego. He was with us in Course II; and shortly after graduation he moved to Coronado, a suburb of San Diego, Calif.

The Secretary has been given the following paragraph from a letter from Richard H. Pough'26: "I have just gotten back from a visit to my mother in St. Louis. She was 88 on the 21st of this month [April, 1958] and will before long, I think, be one of your oldest if not your oldest Alumna of the Institute. She is still in fine health and thoroughly enjoying life. To date, she hasn't missed a year in the National Parks of the West, and is hoping to go again next summer [1958]." The Mrs. Pough mentioned in the letter is Mrs. Alice H. Pough who graduated with us in '92 in Course VII and in recent years has made her home in St. Louis, Mo.

The Secretary hopes to hear from other classmates before our mid-winter Alumni meeting. — CHARLES E. FULLER, *Secretary,* P. O. Box 144, Wellesley 81, Mass.

1894

Although these notes are written just at the season when our thoughts are filled with good wishes for classmates and friends, it happens that the Secretary must report that new inroads have been made on our old friends of student days; and it is saddening to have to make this type of report at this time. In the last days of October came the unwelcome news that Nathaniel H. Morison, who was an origi-

nal member of the Class but who left at the end of the first year, died at his home in Middleburg, Va., in November, 1957. The latest information from him received by the Secretary some years ago indicated that he was not in business but had retired to his farm in Middleburg. No information as to his later life or the cause of his death is available.

A letter just received from Edward M. Hunt, long active in professional life and in civic activities in Portland, Maine, conveys the sad news that his charming wife, who has often been with us at our five year reunions and at Alumni Days, had been stricken so that they could not come to this year's Alumni Day and had passed away in August, after almost 52 years of happy married life. The Secretary wrote to Ed at once expressing our sorrow and sympathy. Those who have attended the five year reunions, and particularly that of 1954 when we celebrated our 60th anniversary of graduation, will remember them both with pleasant thoughts; and it is sure that Ed will have the warm sympathy of all his classmates.

Only three days ago came the notice of the death of another of our distinguished classmates, Theodore Horton, who died on December 7 and whose funeral is being held as these words are written. Horton was a very prominent sanitary engineer and had made a brilliant record. Born at Plattsburg Barracks, N.Y., November 7, 1871, the son of Lieutenant Colonel Samuel M. Horton (later Deputy Surgeon General, U.S. Army) and Sallie Knox Horton, his early life was spent with his parents at various Army forts, including Fort McHenry at Baltimore, Fort Douglas at Salt Lake City, Fort Riley at Kansas City, and Fort Adams at Newport, R.I. He prepared for M.I.T. at the Rodgers High School at Newport and a year at Racine College, Racine, Wis., entering with our Class in 1890. He entered the Department of Sanitary Engineering which had recently been established and received his S.B. degree in that Department in 1894. He was an excellent student.

Upon graduation, and through the recommendation of the late Professor W. T. Sedgwick, Horton was appointed health officer of the town of Montclair, N.J., and was the first engineer in the United States to hold such a position. He established a strong department which became the pattern for similar positions, first in New Jersey and later elsewhere in the country. The following year he joined the engineering staff of the Department of Public Works in the city of Brooklyn as assistant engineer on highway construction after successfully passing one of the first Civil Service examinations in the state of New York. He shortly transferred to the engineering staff of the Metropolitan Sewerage System in Boston, doing special hydraulic experimental work, and shortly became assistant engineer in charge of special hydraulic design of intercepting and outfall sewers for the whole metropolitan district. During this work he developed original methods for solving water supply and sewerage problems, which were used successfully in the studies for additional water supply for the city of New York at the turn of the century. He was principal author of a textbook entitled *Discharge of Conduits and Canals*, which was used for years in the teaching at M.I.T. and elsewhere. His eminent success led to his appointment as principal assistant engineer in the highly regarded engineering firm of Hering and Fuller in New York, probably at that time the leading firm of engineering consultants in America and perhaps in the world. For five years he was in charge of designs and reports on water works, sewerage and drainage projects, and so forth, for many municipalities in the United States and in foreign countries.

In 1906 Horton was appointed chief engineer of the New York State Department of Health, where he headed the Sanitary Engineering Division. This became his principal life work and gained for him a national reputation as a pioneer in public health engineering, especially in the field of protection of the safety of public health water supplies and of the removal of pollution from the streams of the state. He was also advisory engineer to the Water Bureau of the city of Albany, where difficult problems required solution.

On retirement from state and municipal service in 1936, he and his family removed to Sandwich on Cape Cod, where he resided until his death and served the town as the chairman of the Sandwich War Ration Board and president of the Sandwich Historical Society. He was a member of many professional societies, including life membership in the American Society of Civil Engineers, the American Water Works Association, the American Public Health Association, the Boston Society of Civil Engineers, and the Association of State Sanitary Engineers. He was past master of Masters Lodge #5, A.F. and A.M., of Albany; a 32d degree Mason; a member of the Military Order of the Loyal Legion of the United States and of numerous clubs. He was active in Boy Scout work and member at large, Boy Scouts of America.

Horton is survived by his wife, Ann Brunton Horton; a stepson, John Girvan Horton, 2d, of Wyncote, Pa.; a daughter, Mrs. Walter M. Woodward of Nassau, N.Y.; and two grandchildren. Burial was in the family lot in the Albany Rural Cemetery.

Those of us who knew him throughout his long and brilliant career can only feel that we have lost a loyal and deeply respected classmate and an equally loyal and true friend. — SAMUEL C. PRESCOTT, *Secretary*, Room 16-317, M.I.T., Cambridge 39, Mass.

1896

In December President Killian wrote about the administration changes at M.I.T.: "Dr. Vannevar Bush, who has served as Chairman of the Corporation for the past two years, was elected Honorary Chairman of the Corporation." I wonder if Paul Litchfield would tell us what he does in his Honorable Chair? At the November meeting of the Alumni Council George Owen'94 said he was pleased to hear the resolutions concerning John Rockwell, that John was of much help to athletics at M.I.T. and that he ran on the relay team with him. The Mechanics Building, where the indoor track meets were held, is to be torn down to make room for buildings the Prudential Insurance Company is to build.

"The cost of a four-year undergraduate education today at M.I.T. is between $11,000 and $12,000. Student aid amounts to $2,000,000," was reported by Thomas F. Pitré, Director of Student Aid, at the Council meeting. Through the College Scholarship Service standard financial information is made available to all participating colleges. Mr. Pitré said nothing about a qualified applicant being accepted by several colleges and the applicant later deciding on one of the several to which he had applied.

Dr. Harriet L. Hardy, M.D., who is assistant director in charge of Occupational Medical Service, traced the history of O.M.S. from 1944 when the Institute first engaged consultants from the Massachusetts General Hospital and the Harvard School of Public Health. The prolonged applause that she received was well merited and not mere courtesy to the first woman to address the Council.

Some may have taken freshman English in Robert Herrick's section where three essentials — unity, clearness, and coherence — were stressed as necessary in writing. The Secretary is not qualified, despite his long-ago one year's training, to write an interesting column. Furthermore the editors have cautioned the writers of class notes to have brief notes of the doings of their classmates. So please tell me what you are doing; probably most of us are retired and would like to know how you spend your borrowed time. — JAMES M. DRISCOLL, *Secretary*, 129 Walnut Street, Brookline 46, Mass. HENRY R. HEDGE, *Assistant Secretary*, 105 Rockwood Street, Brookline 46, Mass.

1897

Last August your Secretary and Mrs. Ilsley spent two weeks at Wolfeboro, N.H., overlooking Lake Winnepesaukee and not too far from the beautiful Bald Peak Colony Club at Melvin Village. Through the kindness of friends we were able to visit that scenic establishment on several occasions with much enjoyment. During our stay in the Granite State, we drove over to West Franklin and had a delightful visit with Jere and Charlotte Daniell. The latter served a delicious luncheon on the piazza overlooking lovely Webster Lake.

What a delightful hillside farm they have — sloping southward toward the lake, with a charming old house and all the pleasures of country life as well as the privileges which the large lake affords.

A letter dated November 21 from Jere reads: "Heavy clouds this morning with a light sprinkle of rain. The November Review is here with the notes of the passing of Charlie Breed and the good write-up of Irénée du Pont. Apart from our own Class we were very grieved to note the passing of Dr. Rockwell of '96. The years are certainly taking their toll. Then to add to the above, we saw the notice in the *New York Tribune* of the passing of Weymouth and a note from Mrs. Olin in Braintree of her husband Ned's passing. We will miss them both.

"Of the Daniells, no especial news. We are at 'The Farm' as usual and all battened down for the approaching cold weather. So far November has been very kind. Only one short sprinkling of snow, which melted quickly, and only two or three days when the mercury dropped below 30 degrees. A good deal of cloud and drizzle and not too much sunshine.

"Have only taken one short cruise in the car. That to New London, Conn., to have a two-day visit with our old friends the Captain O'Connors of the Coast Guard. Were able to attend service in the fine Coast Guard Chapel and with them, as their guests, to have dinner at the Officers' Club of the Groton Submarine Base. Had a fine, if too short, trip all around.

"We often think seriously of going south for the winter but so far have always stayed on here through all the snow and ice and rather enjoyed it, so long as we were well and *real husky*. Will let you know if by any chance we should change our mind this year.

"Our very best to you for the coming holiday season and for always, in which Charlotte joins me."

We were pleased to learn of the award presented *in absentia* to our Class Agent George R. Wadleigh by President Wilson of our Alumni Association on September 12 "for significant contribution to the work of the Alumni Fund." Refer to page 27 of The November Technology Review.

To supplement the award in concrete form, George received two high fidelity records of Liszt and Handel. Some people get all the gravy.

A letter from George includes the following: "A 'scout' recently at M.I.T. in behalf of a paper company, one of the largest, told me that M.I.T. mechanicals were not a bit interested in paper mill jobs though starting at $450 to $500 per month. They all want something mixed up with nuclear physics, plane propulsion, and so forth. Paper making is too much down to earth mechanics. I am a bit afraid that in this country we are developing too many chefs who don't want to see that the details of cooking are carried out."

In our November notes there was an item about a possible reunion next June. As the issue was delayed in reaching you, the elapsed time is short; but up to date (December 5) no word has been received from any member of the Class either pro or con regarding the suggestion of Gus Lamb about a "62d." It cannot be denied that time passes on. — JOHN P. ILSLEY, *Secretary*, 26 Columbine Road, Milton 87, Mass.

1899

The reunion committee — consisting of W. A. (Tim) Kinsman, President; Miles S. Sherrill, Class representative on the Alumni Council; Burt R. Rickards, Secretary; and Percy W. Witherell, Assistant Secretary — met at the University Club in Boston on December 9 to discuss plans for our reunion on June 13. The committee was unanimous that all festivities should be held preferably on the campus or in Cambridge or Boston. The question of holding a class luncheon on Tuesday, June 16, or a dinner on Sunday, June 14, was discussed; and the preference among classmates seemed to be for Sunday evening. A boat cruise on the Charles River basin in order to view from the river the mile or more of M.I.T.'s waterfront was discussed. Classmates are requested to send to the Secretary any suggestions or ideas for the class reunion. The all-Tech reunion, Alumni Day, will be on Monday, June 15.

Ed Packard is now (December) at his winter home at 1413 59th Street South, Gulfport, Fla. He is feeling well but still confined to his wheel chair. I know he would appreciate receiving a card from you.

Changes of address: Bassett Jones, 200 East 66th Street, New York 21, N.Y.; Ralph Pinkham, 1401 Southeast 2d Court, Fort Lauderdale, Fla. — BURT R. RICKARDS, *Secretary*, 349 West Emerson Street, Melrose 76, Mass. PERCY W. WITHERELL, *Assistant Secretary*, 84 Prince Street, Jamaica Plain 30, Mass.

1900

We have received from the M.I.T. Club of New York the schedule of class luncheons held at the Biltmore Hotel, New York City. The Class of 1900 has its luncheon on the first Monday of each month. The sponsor is Charles H. Hughes, 2681 Amboy Road, Staten Island 6, N.Y. (telephone: EL 1-2396).

If anyone of our classmates happens to be in New York on this day of any month and is interested in meeting with other classmates, it would be well to communicate with the sponsor. — ELBERT G. ALLEN, *Secretary*, 11 Richfield Road, West Newton 65, Mass.

1902

Word has been received of the death of Benjamin F. C. Haanel, XIII, at Ottawa, Canada, on April 24, 1958. He had served his native country from 1905 until his retirement, about 11 years ago, in the Department of Mines and Resources, where he organized the fuel research laboratories within the department and did notable work as its head. He was chosen to represent his government in several important world conferences on power and presented papers at each. Dalhousie University honored him by granting him the degree of LL.D.

I am indebted to a justly proud wife for the program of Charter Day at the University of Oregon when citations were presented to three men of whom one was Ernest Boyd MacNaughton, "son of New England (who was) trained to the profession of engineering architecture."

Although too long for complete quotation, the citation praised in extremely laudatory terms the great contribution of Mr. MacNaughton to his adopted state in many diverse fields, especially banking, publishing, and education. While no mention is made of the source of his training, '02 recognizes Mr. MacNaughton as a classmate at the Massachusetts Institute of Technology and is proud that Tech has again made good her boast that she teaches her students to think, thus preparing each to succeed in any project to which he may later direct his effort. The two other citations were to graduates respectively of Yale — Johns Hopkins and Harvard. Further evidence that the East still contributes to the growth of the nation.

A splinter class reunion occurred in November in Salem when Patch and Moore journeyed to that ancient settlement. Though both are world travelers, neither had ever visited the Peabody Museum; and Philbrick had the pleasure of introducing them to that institution — one of the world's most noted and possessor of treasures from the Orient, particularly Japan, which are absolutely unique. An informal class meeting was held in the room of the old Marine Society to discuss the "defection" of Lew Moore, who had made known that he would make his home in Florida at Vero Beach after December, 1958. As Lew is both our class president and representative on the Alumni Council, a new representative to the Council must be appointed; Dan will serve temporarily. — BURTON G. PHILBRICK, *Secretary*, 18 Ocean Avenue, Salem, Mass.

1903

We are pleased to announce that Robert J. King, III, has accepted the responsibility of class agent, succeeding Thomas E. Sears, whose sudden and untimely death saddened us all. Dr. King is president of Robert J. King Co., Inc., of Norwalk, Conn. Active in academic circles as well as in chemical engineering, he has long been interested in Piedmont College, Demorest, Ga. On October 26, 1958, the newly erected King Science Hall was dedicated. At the ceremonies Dr. King was the main speaker. He discussed the motivation which prompted the erection of such a building, taking for his subject "Is Love Practical?"

While on a trip to the Long Island area last fall, your Secretary called at the home of Emmor H. Millard, II, in Floral Park, N.Y., but found that both he and Mrs. Millard were seriously ill and at a nursing home. Later, his daughter, Mrs. Helen M. Teto, reported that his death occurred on October 28, 1958. He had been retired and in poor health for some years.

W. E. Mitchell is spending considerable time as chairman of Georgia Institute of Technology Research Institute, trying to help in the development of an adequate research organization. — LEROY B. GOULD, *Secretary*, 36 Oxford Road, Newton Centre 59, Mass. AUGUSTUS H. EUSTIS, *Treasurer*, 131 State Street, Boston 9, Mass.

1904

These notes are being prepared for a December 15 deadline, and we have already received some Christmas cards. Frank Davis and wife are making plans to attend our 55th reunion in June. He mentions being on Cape Cod last summer for a time. Sorry you didn't look us up, Frank. The Guy Palmers are also reunion conscious, but Mrs. Palmer must soon have a hospital session for eye trouble. The Currier Langs are heading for the

Virgin Islands soon after Christmas to build that winter residence they mentioned last spring. The Whitakers report taking cruises and other trips via television at their New Jersey home. Mrs. Hiller, widow of our late classmate, sent a card just as she was leaving on a cruise.

The following are excerpts from a letter received from Charlie Haynes: "I was glad to see the notes of the Class in the November issue, but sad indeed to read of the passing of Dave Elwell. He was one of the most likeable, even tempered chaps I have ever known. He and I sat together as freshmen in Freehand Charlie's course, and in later years I saw him many times in connection with engineering jobs Lockwood Green did at factories I was connected with. During August George Curtis tore himself away from Pittsfield activities to pay me a two-day visit. A very enjoyable one for me. He and I got in 27 holes of golf interspersed with various other activities. His well educated #5 iron could make the ball do things I couldn't duplicate. I am currently two down with nine holes to go. I am all in favor of a 55th and will go anywhere our class officers and regional directors suggest. I got so much out of the 50th; and while this would be an anti-climax of that, let's let it be such and get what pleasure we can from meeting those of our group who still are able to get around. But what a lot of splendid companions we have lost in that short interim."

Sorry we haven't more to report, but we can only remind your for the nth time that we are dependent on you for news.

By the time you read this, spring will be just around the corner and June not far away; so put another contribution in the piggy bank for your reunion trip. If you won't write you can at least come and report verbally. — EUGENE H. RUSSELL, JR., *Treasurer* and *Reunion Cochairman,* 82 Devonshire Street, Boston 9, Mass. CARLE R. HAYWARD, *President, Acting Secretary,* and *Reunion Cochairman,* Room 35-304, M.I.T., Cambridge 39, Mass.

1905

These notes are being written at our new home (also new '05 national headquarters) with a prediction of 12 inches of snow due this evening. Please note you sissies, who ducked the falling leaves to go to one of the warmer retreats, where you supposedly bask in the sun but shiver in summer clothes and houses if the thermometer hits the low 50's — and it does and will. This ought to bring an avalanche of rebuttals from you pseudo-Floridians and Californians, but your poor Secretary needs news and doesn't care how he gets it.

I had a splendid letter from Gib Tower, XIII, regarding the trip he and Elizabeth took to Europe this fall; but it missed the deadline for the January Review by a whisker. So here's the quote: "Reporting that we got to Europe and back. Smooth seas and good weather. Neither Elizabeth nor I had a sick day during our eight-week absence. Preferring an ocean voyage to flying, we went to Montreal where the Cunard *Ivernia* sailed on September 5. We went tourist class as did about 85 per cent of the passengers. Everything was fine — we wouldn't want anything better. The few first class passengers seemed rather lonesome. Landed at Le Havre, then train for Paris for three days. Night train to along the Riviera, through Cannes and stopping at Nice, a beautiful beach resort, for two days.

"Continued by bus through Monaco to Genoa, spending one night there. Train to Rome for three days, and we saw Pope Pius at Castel Gandolfo. Then a bus trip up through the middle of Italy via Assisi to Florence for two nights. Train to Venice, three nights; then to Milan and Lucerne, Switzerland, a most pleasant place. Train to Mainz (Wiesbaden) Germany for steamboat trip down Rhine to Coblenz, then train for Amsterdam for two days. Train to Brussels, spending one afternoon at World's Fair, which was enough. Train to Ostend, then boat to Dover and train to London. All the foregoing was with a Cook's tour party of 16, which was very pleasant and satisfactory. All hotel and transportation arrangements were made by the Cook man who accompanied the party. No cares or worries.

"In London we spent a week seeing most of the sights including the Queen. In every city we would first buy maps and guide books, then get a taxi and drive from one end to the other so we didn't miss much. For one week we traveled around in England by bus and railroad train to Bath, Salisbury, Winchester, Oxford, Cambridge, Old Hingham, and Canterbury. Home by Cunard *Saxonia.*" Incidentally, a clipping from a Quincy (Mass.) paper commenting on Gib's return from his vacation refers to him as a Navy hull technicist. At any rate, he still is actively working, which is perfectly natural for the youngest '05 graduate.

Not that it is so unusual for '05 men to be in active service, for I know from seeing them around Boston that these fellows are in active service, mostly on their old job: John Ayer, Henry Buff, Carhart, Cronkhite, Ralph Emerson, Files, Goodale, Helpern, Kenway, Killion, Doc Lewis, Lovejoy, Nye, Pirie, and Stevenson. I doubt whether any other section has that record of durability — or is it consecration? Rebuttals on this point are also requested, yes, challenged.

From a Christmas greetings card from Joe and Gladys Daniels I learn that since October they have been on a tour to the Antipodes, New Zealand and Australia, Auckland, Sydney, Suva, Christmas Day at Greymouth, New Zealand, returning to Seattle the latter part of February. Any more travel tours to report?

Through George Merrill Bartlett and a clipping from the *Providence Journal,* we learn that Walter (Bobby) Burns, V, died on November 5, 1958, after a long illness. I quote from the clipping: "He had lived in Warwick for four years. He retired in 1954, having been employed as a chemical technologist by the American Dyewood Corp. of New York for 45 years. He lived for 23 years in Schenectady, N.Y. Born in Glasgow, Scotland, September 23, 1881, he came to this country as a boy. He belonged to the Chikina Lodge, A.F. and A.M. of Millville, N.J., and the Order of the Mystic Shrine, Auburn, N.Y. Survivors are his wife, Maryann (Harvey) Burns; two sisters, Miss Jean Burns and Miss Janet Burns, both of Gaspee Plateau."

Incidentally, Peggy reports that he is in good health, "play golf when the weather permits, and am enjoying being a bum." Mrs. C. S. Maddock, Trenton, N.J. (nee Elizabeth H. Middleton, VII), died on November 3, 1958. — FRED W. GOLDTHWAIT, *Secretary,* Box 123, Center Sandwich, N.H. GILBERT S. TOWER, *Assistant Secretary,* 35 North Main Street, Cohasset, Mass.

1906

The latter part of November came a letter from Jack Norton, who still runs the Lindsey Vineyard in Tryon, N.C. He had just learned through the class notes of the death of Sherley Newton, with whom he had formed a close friendship during student days as they took the same Course and sat together in many classes. At the time that Sherley was chemist at Sherwin Williams Chicago plant, Jack was doing graduate work at the University of Chicago and says they spent their recreation hours together. "He was often at my home and we were all very fond of him. He became an expert in the manufacture of color for use in paint. I have kept in touch with Sherley for over 50 years, although we met only at long intervals. His death is a personal loss to me."

Another personal loss to many occurred on December 4 when Harold Vinton (Otis) Coes died in Morningside Hospital in Montclair, N.J. He was born June 21, 1883, in Hyde Park, Mass., but he grew up in Germantown and prepared at Central High School and Northeast Manual Training School in Philadelphia. Harold was on the sophomore tug-of-war team, and coached the 1908 teams; chairman of the house committee of the Tech Union (what good times we had in that room over the shops!); president of the Mechanical Engineering Society; also secretary of the Pennsylvania Club. His thesis was, "A Determination of the Live Load on Locomotive Driving Springs Under Actual Running Conditions" with Charlie Howard. More recently, as you all know, Harold was marshall of the Class at the graduation exercises of the Class of 1956; and in his talk to them at the luncheon he gave them sound advice, as president of 1906.

Harold has told how he took a couple of years after graduation to look around to ascertain the phase of engineering that most interested him. And he did get around — Western Electric; Pennsylvania Railroad engineer test, Pope-Waverly Co., Indianapolis; draftsman and assistant to mechanical engineer, New York Edison Co. In 1908 he went to Chicago as technical assistant to the president of Liquid Carbonic Co., became mechanical engineer and then civil engineer, assisted in the design, supervised construction, and operated, the largest carbon dioxide plant — in Cambridge, Mass. — that had been built up to that time. He was consulting engineer for the Searchlight Gas Company in Chicago. Having a taste for management problems, he joined Lockwood Greene and Co. in 1913, first as manager of their Chicago office, and then came to

Boston as assistant industrial engineer in the home office. Harold soon thought he needed more experience in manufacturing and in 1915 accepted appointment as vice-president and general manager of the Sentinel Manufacturing Co. in New Haven. Then came the first break, when a serious operation forced him to resign and he was out of circulation for about a year.

By that time the first world war was on, and through Charlie Howard he was asked by the New York firm of engineers Gunn, Richards, and Co., to go to Canada to reorganize munition plants. That assignment kept him busy for a year or two, and when the United States entered the war he returned to Washington and put in a purchasing system for the Allied Purchasing Commission. In 1917 he joined Ford, Bacon, and Davis to supervise design and construction of munition plants; built a toluol plant and a scotch marine boiler plant; and took over the operating management of the Dayton plant of Platt Iron Works, which built most of the whippet tanks, besides torpedo compressors and pumps, shells, and so forth; designed and built a large washing machine plant in Syracuse; opened and managed a Philadelphia branch office for Ford, Bacon, and Davis in 1921. From 1924 to 1928 he was vice-president and general manager of Belden Manufacturing Company, in Chicago. By 1930 (Harold had written), "Problems of marketing and distribution began to come to the fore," and he became manager of the Industrial Department of F.B. and D.; a partner in 1937; vice-president in 1941; and a director in 1943. During that period he "specialized in the analysis of business ailments and their correction," retiring in 1948.

In later years Harold has devoted much of his time and talents to international co-operation. It was in 1945-46 that he served as consulting engineer to the Planning and Development Board of the government of India (about which he gave us a fascinating talk at one of our reunions). In 1949, after declining several invitations to join one or another of the U.S. government agencies, he finally agreed to serve in the Paris office of Economic Co-operation Administration; so in May he and Agnes took up residence at the St. James Hotel. A paragraph in his letter to Jim in July, 1949, seems to give a vivid picture of Harold Coes's sterling character. It appeared in the November '49 class notes, but its import and significance are even more apparent today: "The work is fascinating, for one is dealing with the economies of all the countries participating in the Marshall Plan for European Recovery. Great strides have been made. A lot more yet to be done. But I have faith it will be done, for everywhere the Marshall Plan was put into operation it stopped the Commies cold in their tracks. That is the main reason I agreed to come over here. I had two sons in the active theatres of war in Europe. I have two grandsons [now three] I do not want to see get into another war. So to the extent that Grandpa can go to work to help protect their future and the sons and grandsons of people everywhere that hate war, then Grandpa will feel that his activities in his declining years have been worth while."

All during his professional career, and more recently, Harold has also devoted his time and talents to industry and humanity through his writings and in numerous societies and associations. Nearly 20 years ago his book on *Production Control* was published; and he had been associate editor of the *Handbook of Management and of Business Administration,* not to mention numerous papers and articles before and since. His memberships were many: American Society of Mechanical Engineers, of which he was president in 1942-43 and an honorary member and fellow; trustee and past president of United Engineering Trustees, Inc.; director and life member, American Management Association; past president, Association of Consulting Management Engineers; fellow and past president, Institute of Management; member, National Management Council, American Engineering Council, Society for Advancement of Management, Industrial Marketing Executives, the American Arbitration Association; and director of Engineering Index, Inc. He was also a member of the Army Ordnance Association, St. Andrews Society, the Newcomen Society of England, the Engineers Club of New York, M.I.T. Club of Northern New Jersey, and Unity Church of Montclair. Harold served for several years on the Montclair planning board.

On April 12, 1950, the New York *Times* carried a fine likeness of Harold and reported: "The National Management Council has named Harold V. Coes, Vice-president of the American Management Association, as consultant to the United Nations, it was announced yesterday. The Council represents all other United States management societies and business groups in their foreign affairs. Mr. Coes also will represent businessmen in Europe and Latin America through the International Committee for Scientific Management." But as you might know, Harold was not only interested in economics and management and industrial problems but also took an active interest in the education of engineers, being a member of the advisory committees of the Industrial Engineering Department of Columbia University and the College of Engineering of Princeton University and also I believe, of M.I.T. He had some time, too, for avocations. They spent summer vacations in Maine and on Cape Cod, and in 1936 he wrote: "My hobbies, when I can indulge in them, are fly fishing and sailing one-man sloops."

On June 5, 1909, Harold married a girl he had grown up with in Germantown, Agnes Wickford Day. Survivors are his wife; two sons, Kent Day Coes of Montclair and Dr. H. Vinton Coes, Jr., of Sussex; and three grandsons. Memorial services were held on Sunday afternoon, December 7, at Unity Church in Montclair, and were attended by Stewart Coey, Burton Kendall, and Joseph Santry. Stewart had kindly arranged for a floral tribute from "M.I.T 1906 Classmates." We are also indebted to Stewart for informing us promptly, as he telephoned on December 4 to Jim, who relayed the sad news to me. It was an unusual tribute to Harold for me to receive, within a few days, newspaper clippings covering his career in much detail not only from Stewart but also from Floid Fuller; C. A. Clarke, Secretary of '21; and Mrs. Guy C. Peterson, widow of an '01 man. Harold Coes possessed to an unusual degree those attributes which made him so friendly, so industrious, so competent, so productive, and consequently so highly honored and esteemed. His family, the Class, the Alumni Association, and society have lost a cherished member. — EDWARD B. ROWE, *Secretary,* 11 Cushing Road, Wellesley Hills 81, Mass.

1907

You see the Review regularly, presumably read the '07 class notes, and hence know the names of the president and secretary and treasurer of our Class. You may not realize, however, that other '07 men have positions of responsibility in the organization of the M.I.T. Alumni Association. Here they are, as noted from the recently published directory of the Association. Tom Gould is our class representative on the Alumni Council; Harry Moody is a member of the Council as the representative of the M.I.T. Club at São Paulo, Brazil, South America; Roy Lindsay is a member of the Educational Council in Buffalo, N.Y.; Don Robbins is a former president of the Alumni Association.

John H. Link, a graduate in the Course in Chemistry, died on October 31, 1958. He was never a very active or communicative member of our Class. After graduation he was particularly interested in rubber chemistry; but work in that line so seriously affected his health that he had to give it up, and he became a teacher in the senior high school in Marion, Ind., where he stayed all of his life until he retired a few years ago. Since his retirement he and his wife traveled quite extensively in various parts of the world. He is survived by his wife at 1107 West 6th Street, Marion, Ind.

Kenneth Chipman and his wife have moved from the home which they occupied for many years, and their address is now Apartment 304, 85 Range Road, Ottawa 2, Ontario, Canada. A thoughtful card from Seymour Egan (usually called Bill) received in December states that he is "well, frugal, happy." He visits his married daughters and their families in Jersey City and Churchville, Md., two or three times a year, and in summer spends time at his son's blueberry farm in New Hampshire. Bill is retired and lives at 40 Fairmont Avenue, Wakefield, Mass.

Only four months from the time you are reading this to our 52 year reunion, June 12 to 14. — BRYANT NICHOLS, *President* and *Secretary,* 23 Leland Road, Whitinsville, Mass. PHILIP B. WALKER, *Assistant Secretary* and *Treasurer,* 18 Summit Street, Whitinsville, Mass.

1908

The third dinner meeting of the 1958-59 season will be held at the M.I.T. Faculty Club, 50 Memorial Drive, Cambridge, Mass., on Wednesday, March 11, 1959, at 6:00 P.M. Ladies are invited.

Plans for our 51st reunion will be discussed. The reunion will be held at the Melrose Inn, Harwichport, Mass., on the Cape, June 12 to 13 and 14, 1959. This is where we celebrated our 48th and 49th reunions. Once again we will have the Beach House for our headquarters. Make your plans now to be with us.

The *Engineering News Record* of November 20, 1958, had the following: "The Gold medal of the British Institution of Structural Engineers, awarded only three times in the last 35 years, was bestowed on Professor Hardy Cross October 29 in Manchester, England, as a part of the 50th anniversary celebration of that organization.

"One of America's greatest engineering teachers and structural analysts, Professor Cross was chosen for the signal honor 'for his outstanding contribution to the science and art of structural engineering during the past 40 years.' Now retired and living in Virginia Beach, Va., Professor Cross, who is 73, went to Britain to receive the medal in person.

"Professor Cross is most widely known for his development of the structural design procedure called successive approximation, which has had extensive application in analyzing moment distribution in structural frames and in determining flow distribution in pipe networks. In fact, the moment distribution procedure is commonly called the Hardy Cross Method.

"Highly regarded also as a teacher, Professor Cross taught structural engineering at the University of Illinois from 1921 to 1937, and then became chairman of the Civil Engineering Department at Yale University. When he was awarded the Lamme Medal in 1944 by the American Society for Engineering Education, he was praised for 'his insistence on the great responsibilities of the individual teacher and his scorn of the superficial in education; and for his pre-eminence in building men who are carrying forward his own high standard of straight, hard thinking in the teaching and practice of engineering.'

"Professor Cross responded to the award of his medal with an address on 'The Relation of Structural Mechanics to Structural Engineering.' "

What have you done about our Class Agent George Belcher's letter of December 1, 1958? Fifty-seven per cent of our Class subscribed to our 50th year gift last year. Let's see if we can't get a higher percentage this year. You don't have to give a large amount to be counted, so give something for the glory of 1908. We are still in the market for news. H.A.S.N.? — H. LESTON CARTER, *Secretary,* 14 Roslyn Road, Waban 68, Mass. LESLIE B. ELLIS, *Treasurer* and *Assistant Secretary,* 230 Melrose Street, Melrose 76, Mass.

1909

In the November Review, by error, George Palmer, VII, was reported as having attended Alumni Day, rather than Herbert Palmer, VIII. We apologize. George, who now lives in Berkeley, Calif., has written to Francis Loud, VI, relative to the anniversary, that on account of distance it will be too difficult for him to make it. He has, however, contributed to the class fund and wishes us every success. George is a particular friend of Francis since, as students, they lived in the same house along with Harold Stewart, VI, and Harvey Pardee, VI. George has now retired, having been consultant on public health training for the state of California Public Health Service. Herbert Palmer, who usually attends our Class and Alumni events, now lives in Georgetown, Mass.

We well remember Allen Jones, II, who came from Georgia to attend our 45th reunion. He writes that he was Clemson College'09 and gave up his 45th reunion then to attend ours at Chatham Bars Inn. Hence he feels that this time he should attend his 50th at Clemson and will therefore, not be with us. He plans to retire December 31.

The 50th anniversary committee wishes to express its appreciation of the generous response to the request for a contribution of $5.00 towards the anniversary expenses. Already (December) about $300 has been contributed with more coming in. Quite a few went over and above the call of duty, and we owe them our special thanks.

Some questions have been raised concerning wives coming to the reunion. The notice states that we hope the folder will "make you want to be there with your wives and children and grandchildren." Since this was merely a preliminary notice with others to follow, no attempt was made to specify the details.

The following notation was written on the reply to the anniversary notice: "I regret to advise that Mr. Phifer Smith passed away on the early morning of November 3 at Alexian Brothers Rest Home, Signal Mountain, Tenn., and was buried in their family burial lot in Livingston, Ala., the next day. I have been serving as his guardian since mid-1956. He was never married and had no close living relatives. He suffered a stroke about a month before his death. (Signed) E. A. Stubbs."

We of Course VI particularly regret the passing of Phifer. He was fine looking and with his pleasing southern drawl was known as Alabama Smith. He prepared for the Institute at the University of Virginia and was a member of Sigma Chi, the Walker Club, and Hammer and Tongs. Our records show that aside from being connected for a short time with the Bangor Railway and Electric Company in Maine and the Pennsylvania Power and Light Company at Allentown, he spent all his time in the South, most of it in Alabama.

Art Shaw, I, received the following from Art Morrill, XI, in Venezuela: "I was glad to get your penciled note on the Alumni Fund letter of October 1. As for the 50th reunion, unless the heavens fall I'll be there. For several years I have taken my vacation in Detroit at Christmas time, but this year I am saving up time to have a double vacation at the time of the reunion.

"The 'recent disorders' you mentioned did not trouble me much. Through the January 23 revolution I went to the office every day, though we left early to get home before the curfew. The worst thing that happened to me was that I had to make an evening meal of grapefruit, oatmeal, and coffee, repeating my breakfast, because all the restaurants were closed. I always eat out in the evening, and so did not have anything in the house except things for breakfast. There was a general strike and all the groceries were shut tight.

"So I am looking forward to the reunion. You, according to the pictures I see once in a while, haven't changed so much; but I am afraid nobody will recognize me as the skinny guy that was in Course XI. Maybe I will have to have a big card on my lapel."

Also, Sam McCain wrote to Art from Syracuse as follows: "Your Alumni Fund letter arrived quite a while ago, just after I had returned home from a long siege in the hospital. I have been unlucky enough to have had four operations in the past two years, and it has certainly knocked me for a loop both physically and financially. I am coming along in fairly good shape now and hope to be at the reunion in June. I have a daughter who lives in Pembroke — 25 or 30 miles southeast of Boston — and hope to visit her and her family at the same time." — CHESTER L. DAWES, *Secretary,* Pierce Hall, Harvard University, Cambridge 38, Mass. GEORGE E. WALLIS, *Assistant Secretary,* 185 Main Street, Wenham, Mass.

1910

My only but most efficient correspondent, Carroll Benton (and how I wish there were more like him in the Class), reports on the November class luncheon in New York, N.Y., as follows:

"Just a few lines to keep you and the other classmates informed regarding our last monthly luncheon on Wednesday, November 19. It was held, as usual, at the M.I.T. Club in the Biltmore Hotel. The following six men were present; Gordon Holbrook, Henry Schleicher, Larry Hemmenway, Jim Tripp, Harold Parsons, and Yours Truly. Parsons, looking as young and chipper as ever, was able to make it for the first time in quite a while; and needless to say we were all glad to see him. He told us that he was now retired (from the Edward Ehrbar Co.) but that he was keeping busy selling (or renting or both) heavy construction equipment. He has more time now and promised to attend the luncheons more often in the future than he has been able to do in the past.

"Harold and I, along with Johnny O'Neill, Course XI, did our graduation thesis together down in Gloucester, Mass. (That was Parsons' old home town.) We were trying to locate and plot the currents in the Gloucester harbor in connection with the determination of an outfall for a sewerage system. (Incidentally, we got paid for our expenses by the city.) Was it cold that spring of 1910 as we rowed around the harbor taking shots with a sextant on floats (topped with a little red flag) as they bobbed up and down in the water! Then, to cap it all off, at the end of the day we would go up the hill to Harold's empty house (his parents were in Florida), build a fire in the fireplace, and try to get warm. Of course the beds, not having been occupied all winter, were

not too comfortable either. It's a wonder that we didn't get pneumonia. Some years later (about 1915 or 1916) I was best man at Harold's wedding in Mt. Kisco, N.Y.

"To get back to the others who could not attend the last luncheon — Ray Jacoby, George Magee, Erford Potter, and Fred Dewey all had other engagements. Carroll Shaw was out of town. Al Hague is, I presume, enjoying the balmy weather in Florida. At our September meeting he said he and Mrs. Hague were leaving the following week in his boat to stay there all winter. Lucky Al!

"Hope you and yours have an enjoyable Thanksgiving. Ann and I are driving tomorrow to Norwich, Conn. (near New London), where we plan to spend the holiday week end with my niece and her husband. He is the Episcopal rector there. My brother (a widower) is coming down from New Hampshire to be with us at that time."

Harold Akerly and his wife dropped in for a most welcome visit the Sunday after Thanksgiving. Harold's daughter lives in Waban, so we may expect the pleasure of seeing them during "the family get-together holidays." Harold is now retired and claims he is fully enjoying retirement and is more busy than ever.

Met Bob Burnett and his wife last Sunday. They had come up from Fall River for their Sunday dinner at a very popular place where Mrs. Cleverdon and I were enjoying a very good meal. Bob is now secretary and treasurer of the M.I.T. Club of Fall River, Mass.

Frank Bell is an honorary secretary appointed by President Killian representing the Dallas area of Texas.

Hiram Beebe is the archivist of the M.I.T. Club of Southern California. — HERBERT S. CLEVERDON, *Secretary*, 120 Tremont Street, Boston 8, Mass.

1911

We were delighted to learn from Jim Campbell, I, that Thomas D'Arcy (Steve) Brophy'16 was the recipient of this year's Silver Stein Award of the M.I.T. Club of New York — a grand guy! Jim wrote also that 1911 was represented at the annual dinner at the Biltmore by Dick Ranger and Jim and Toni Campbell. He also thoughtfully enclosed a program signed by these three and a number of other M.I.T. friends of ours present.

Honor is about to be paid to one of our late members — Bill Foster, IV — as shown by the following note received from George E. Pettengill, 1735 New York Avenue Northwest, Washington 6, D.C.: "You gave such a nice write-up to Bill Foster in your class notes for the June Technology Review that I thought you might like to mention the memorial fund which is being established in his name." Mr. Pettengill, Secretary of the William Dewey Foster Memorial Fund, which includes in its membership our illustrious classmate, Ralph Walker, IV, of New York City, told of the formation of the committee "to establish some form of permanent memorial for him. The Committee proposes to present the fund," he continues, "to the library of the American Institute of Architects for the purchase of books on the history of American architecture. It seems appropriate that the library be the recipient of this tribute, since Bill was its architect and considered it one of his favorite commissions. Anyone wishing to give something to this memorial (and no donation is too small), please send check to the secretary. Bill's friends were so many and so loyal, his interests so wide, his talents so assured, that we hope to achieve a memorial worthy of his name."

In response to our fall class agent letter, a letter came from the widow of a classmate telling of the death on August 23, 1956, of Louis Walz, V, at his home, 151 West Main Street, Batavia, N.Y. He was with us for a special course in chemistry during our junior year and completed his education at the Philadelphia School of Pharmacy. Born in Oil City, Pa., in February, 1890, he was graduated from the Oil City High School. Following his college career, he worked for two years as a Standard Oil Company chemist in Oakland, Calif., then returned to Rochester, N.Y., and became a salesman for the American Oil Company, opening a Batavia branch in 1914. He was a World War I veteran.

After the war he continued operating the American Oil branch until ill health forced his retirement. Walz was an active member of St. Paul Lutheran Church and had served as president of the congregation and was chairman of the board of trustees. When plans were made for a new church a few years ago, he gave several memorials, including the marble altar and its appointments, in the name of the Walz family. He belonged to American Legion, Elks, and Y.M.C.A. In 1914 he married the former Gertrude Lasher, who survives, along with a daughter, Mrs. Harry A. Staley of Batavia, and two grandsons.

Had two nice calls in late November, the first from Charlie Hobson, X, of the Barium Reduction Corporation in South Charleston, W. Va. He was in Portland to see his wife, a patient in the Maine Medical Center, following an operation there while on a Portland visit to their son-in-law and daughter, Dr. and Mrs. Stanley Herrick. His daughter drove him up and she, a Westbrook Junior College classmate and bridesmaid of our daughter-in-law, visited there while Charlie was here. He plans to retire at least partially from business in early 1959 and said a proposed merger with a southern company was underway. Two days later three good chamber of commerce executives, one of them now managing director of the state of Maine Publicity Bureau, called and gave me, with Governor Muskie's compliments, a state of Maine sea chest of treasure, full of canned Maine sea food delicacies and booklets.

In the Directory for 1958–59 of the M.I.T. Alumni Association the following '11 men are listed as active participants: life members of the Corporation — Irving W. Wilson, XIV, and Robert T. Haslam, X; class officers — Donald R. Stevens, II, President; Howard D. Williams, Vice-president; Orville B. Denison, Secretary; John A. Herlihy, Assistant Secretary; Alumni Council — Dennie, class representative; Emmons J. Whitcomb, M.I.T. Club of Toledo; Alumni Fund — O.B.D., class agent; H.D.W., special 50 year gift chairman; Association of Class Secretaries — Dennie, executive committee.

Carl Ell, XI, scores another "first" in his last year as president of Northeastern University. Northeastern's 50-year-old co-operative education plant has become international in scope for the first time. John Rardon of Quincy will spend his co-operative period with the Toronto, Canada, office of Peat, Marwick, Mitchell, and Company, chartered accountants. Rardon had previously worked with the firm's Boston office. Northeastern students previously had taken co-operative work in the Midwest, the South, Alaska, and with the Navy at sea, but not in another nation.

An attractive Christmas card at hand from Leroy and Marj Fitzherbert from Spain announces: "We are here in sunny Mallorca for the third time and expect to stay this time until April. Our reason for being here is the mild winter climate and the lower cost of living. Hope you are continuing to improve, Dennie, and may the coming year bring you and Sara much contentment." Another peripatetic Christmas card from Harold and Elma Babbitt, telling of their summer trips after leaving Seattle and before settling down at the University of Missouri in September for Harold's year as visiting professor of civil engineering. In conclusion, the card says: "Our rocking chairs are in storage in Seattle awaiting our return in June, 1959; meanwhile our home address is 807 Donnelly Street, Columbia, Mo." From Sam and Minnie Cornell's card (Garden City, Long Island): "Not much new with us except our son was married in September." Nathan Levy, I, wrote on his Christmas card: "I retired last February from the Metropolitan District Commission, Boston, and am living at Hotel Hemenway, 91 Westland Avenue, Boston 16. Had a severe attack of arthritis but am much improved and outlook is for better."

Enclosed with Carl and Helen Richmond's Christmas card was this note: "I'll be at the Boston Luncheon Club on December 18. Having paid dues the prescribed length of time, I was 'awarded' a 'diploma' at the meeting of the Massachusetts section of the American Society of Civil Engineers at the M.I.T. Faculty Club on December 1, certifying that I am a life member.

On Alumni Day in June, 1956, we were delighted to have Sam Schmidt, VII, on from Cincinnati, accompanied by his wife, whom we all enjoyed meeting very much. Now this letter from Sam: "Simultaneously with this note to you I am mailing a check to the Alumni Fund in memory of my Esther Ida who slipped away in late November. She was quite ill when you saw her with me at Alumni Day, 1956. A few days after that she suffered a stroke, and remained a partial invalid to the last. Her invalidity was only physical, as she remained alert and mentally articulate. We frequently spoke about you, and she was greatly concerned when the news about your illness reached us. On August 26 a dinner was given by the Jewish Heritage Foundation, Inc., of Cincinnati honoring us upon our 46th anniversary and my 75th birthday. She attended in a wheel chair and fully enjoyed

that event. Keep well and keep up your great work for the Class and the 'Stute!" Our hearts go out to you, Sam, in your great bereavement.

Howard Williams is lining up classmates to assist him in the big undertaking he has agreed to head for the Class: raising our 50 year gift to M.I.T. In this connection, we urge all classmates to make this year's contribution to the Alumni Fund as generous as possible, for during these five years between our 45th and 50th anniversaries, all monies contributed to the Fund are counted as part of our golden anniversary gift. First class reports this fall were most encouraging, showing a rise of nearly 45 per cent in average class gift among the first 50 contributors in the Class of 1911.

Now we close this edition of class notes with two address changes: Armand H. Peycke, II, 610 Fifth Street, Wilmette, Ill.; and Roger M. Spencer, II, 166-21st Avenue Southeast, Saint Petersburg, Fla. (from Massapequa, N.Y.). Happy Valentine's Day to you all! — ORVILLE B. DENISON, *Secretary,* Wellsweep, Box 11, Cornish, Maine. JOHN A. HERLIHY, *Assistant Secretary,* 588 Riverside Avenue, Medford 55, Mass.

1912

William S. Wolfe was honored at the New Bedford plant of the Goodyear Tire and Rubber Company recently. Bill is retiring soon after having been with Goodyear for many years.

Upon graduation he became experimental engineer with Goodyear and in 1937 was appointed manager of development and later manager of domestic production. In these positions he has been in charge of the Goodyear plants in New Bedford, Mass.; St. Marys, Ohio; Lincoln, Neb.; Chicago, Ill.; Goodyear Fabric Mills, Jackson, Mich.; rubber heel plant at Windsor, Vt. Also plants at Gadsden, Ala.; Topeka, Kansas; Los Angeles, Calif.; and the main plant at Akron.

Doc Cook reports that Morash is active with the Dudley Lock Company at Toronto, Canada, a subsidiary of United Carr Fastener Co. He has lightened his load somewhat, being in the office four or five hours. His second daughter, Caroline, is engaged and plans to be married soon.

Harold Brackett spent the summer at the old family home in Limerick, Maine. His sister and niece make their home with him and they have all now returned to their winter residence at Oradell, New Jersey.

Bill Canaday reports from DeBary, Fla., that both he and his wife were laid up last spring but are now in fine health again. He reports a temperature of 83 degrees as of December 1 with his poinsettias and hibiscus in bloom. He has just transplanted 144 pinks that will come along later. Last year's freeze set his garden back badly, but he hopes to have it in good shape again soon. — FREDERICK J. SHEPARD, JR., *Secretary,* 31 Chestnut Street, Boston 8, Massachusetts. C. BOLMER VAUGHAN, *Assistant Secretary,* 455 West 34th Street, New York, New York.

1914

Our Assistant Secretary Herman Affel has been the subject of two news items in national journals. The Bell Telephone Laboratories *Record* told of the distinguished record made by Affel during his 42 years at the Telephone Laboratories. He is the coinventor of the coaxial cable system which made possible national wire distribution of television programs. He has been awarded 123 patents on wire and radio systems. The December issue of *Electrical Engineering* told of his service to the industry and in particular to the activities of the American Institute of Electrical Engineers. He is a fellow of four national technical organizations and has received a Modern Pioneer Award from the National Association of Manufacturers. In addition to all of his many activities, he has found time to serve as the Alumni Fund class agent; and you already know the fine record he has made for our Class.

One pleasant thing associated with our five year reunions is that the members of the Class drop a note — as well as a check to keep the Class solvent — to your Secretary. It is not quite as easy during the intervening four years to find interesting items for this column. This is the fifth year, and I can assure you that it is most welcome to receive the many letters and notes from you. Many have sent greetings to Charlie Fiske or enquired about him. You already know that he retired from the very center of New York City to Bath, Maine. Many of his classmates have wondered whether Charlie would stay put when the Maine snow gets deep. The answer is pretty obvious. When Thanksgiving Day arrived, Charlie and Marie packed their bags and moved to New York City. When Christmas arrived, they were off again. Until mid-April they will be at Vista Sierra Lodge, Tucson, Ariz., where any '14 classmates passing that way will be very welcome.

Homer Calver has retired from his Public Health and Paper Cup Trade Association activities, and on December 27 left for Beirut, Lebanon, where he will be a visiting professor in public health at the American University. This is a truly beautiful university on the side of a high hill on the shore of the Mediterranean Sea. Howell Taylor was there at one time. Your Secretary has visited this university several times and can assure '14 men that it is a most attractive spot.

Several classmates have enquired as to where we stay at our reunion in June. So many have eaten at the Publick House at Sturbridge, Mass., that they seem to have overlooked that it is an hotel as well. It is small to be sure, but between it and the neighboring Treadway House we have been assured that we can be well taken care of. Up to a certain date in June we have the exclusive use of the hotel features. We also have a dining room separate from the regular eating facilities. Full details including Old Sturbridge and the Cohasse Country Club will be sent to you in the following announcements. Be sure, however, to make careful note of the dates June 12 to 14, 1959.

Because of the limited space here, it is not possible to report all of the details in the notes your Secretary has received. Many of the items should, however, prove of interest. George Whitwell has retired as the vice-president of the Philadelphia Electric Company but is employed as a public utility consultant in Philadelphia. Carl Springfield has undergone surgery but is well on his road to recovery. He is associated with the Teci Production Company at Sayre, Okla. Al Hoyt is in the steel wire business at Cleveland, Ohio. Claire W. Ricker has retired as head of the Electrical Engineering Department of Tulane University but is consulting engineer in New Orleans.

Dean Fales, who has retired to Kennebunkport, Maine, has learned just to stay beside the oil heater all winter but will be with us at Sturbridge in June. Ray MacCart in his retirement is running an investment company in Washington, D.C. He is looking for no risk oil wells, or the equivalent. Dana Mayo leaves his home at New Castle, N. H., from time to time and expects that one such visit will be for reunion. Phil Scannell is still in a family boiler works company at Lowell but expects to take time off to come to Sturbridge. Harry Wylde has retired to Southboro, not too far from Sturbridge, and expects to be with us to tell us how to run a farm. Harry was formerly with Lever Brothers.

Lin Faunce has retired to Bloomfield, Conn., and plans to travel the 50 miles to Sturbridge and to welcome us on arrival. Thorn Dickinson makes his retired headquarters right on Broadway near Columbus Circle, New York. Last summer he made his headquarters at Shelburne, N.H., in the White Mountains and WALKED 1,100 miles among the mountains, including 135,000 feet climbing mountains and the same down. He is going to Europe this spring but is uncertain as to whether he can return in time for the reunion.

Leigh Hall left Concord, N.H., in December for a three months' visit to Sarasota, Fla. He writes that after such a rest he will be ready to celebrate at the reunion. Dale R. McEnary is very busy in his architectural business at Minneapolis, Minn., and questions whether he can leave his very active construction business in June. Bert Hadley expects to leave his activities as chairman of the trustees of Middlebury College in Vermont long enough to attend our reunion.

Ros Barratt, another of our very active architects, from Southport, Conn., finds Sturbridge near enough to run away for the week end to be with us. Jim Holmes is running around from the far east islands of the Pacific to Washington, D.C., so he possibly might be with us. His business is in Los Angeles. Skip Dawson helped Charlie and your Secretary select Sturbridge and certainly expects to be with us, also to help on the program. Skip lives at Pittsfield, Mass. Ray Dinsmore, Vice-president of the Goodyear Tire and Rubber Company, plans to hop into his private plane and be with us with a good supply of stories. — C. P. FISKE, *President,* Cold Spring Farm, Bath, Maine. H. B. RICHMOND, *Secretary,* 100 Memorial Drive, Cambridge 42, Mass.

H. A. AFFEL, *Assistant Secretary*, R.F.D. 2, Oakland, Maine.

1916

Ralph Fletcher, our busy President, favors us with the following start-off for the column this month: "Once again, it is my pleasure to open our class column with a few comments. First of all, I'm sure we are all quite pleased with the excellent column that our good secretary, Harold Dodge, has been turning out. It always seems to be tops in quality and quantity; and lest we take this for granted, be assured that this excellent column usually is the result of some real hard plugging by Harold. May I encourage all who read this column to 'do it now' — take a minute to write down a few notes about your activities and send them along to Harold so that at least for the next issue he may have it a little easier. We've been getting the same type of persevering effort from our 'Financial Men,' Joe Barker and Bill Barrett. Regularly now in the Alumni Fund statistics the Class of 1916 is up near the top. May I compliment these men for their effective work and also thank the many generous givers who make this fine record possible.

"We are all pleased with the recent honor that came to Steve Brophy when he was presented on November 17 by the M.I.T. Club of New York their annual Silver Stein Award. Many of our classmates attended the dinner and were able to congratulate Steve personally at an informal Class cocktail party following the dinner. Finally, may I call your attention again to the 43d reunion, which will be here very quickly. These annual reunions are beginning to catch on very well, and so that more may take advantage of them we feel that we should publicize them in the column as early as possible. Again this year, we will be at the Chatham Bars Inn in Chatham (Cape Cod), Mass. They have taken care of us wonderfully in recent years. Alumni Day this year is on June 15, and we will be on the Cape on the week end of June 12, 13, and 14. The ladies seem to blend in very nicely at our interim reunions, so we hope that many of them will show up at the 43d. My best wishes to everyone, and I will hope that I will see many of you at the Chatham Bars Inn on all or part of the week end of June 12, 13, and 14, 1959."

Ralph also reports that Joel Connolly was on his way back to his work in Formosa in October, completing a trip around the world, and that Obie Pyle plans definitely on returning for the 45th reunion.

On December 1, Vannevar Bush, who had served as Chairman of the M.I.T. Corporation for two years, was elected Honorary Chairman of the Corporation, effective January 1, 1959. This coincided with the appointment by the M.I.T. Corporation of Dr. Julius A. Stratton'23 as President of the Institute and the election of Dr. James R. Killian, Jr.,'26 as Chairman of the Corporation.

Herb Gfroerer sends a welcome letter, saying: "Irrespective of Dina Coleman's comments about Henry Shepard's hobby, my hat is off to my good friend Henry. I've a hunch that many of our classmates wish they too had such a worth-while avocation. I know Henry is too modest to tell you more, so I'm clipping the following paragraph from his recent letter: 'The Stanley Steamer is now 99.5 per cent restored, and it has been a lot of fun driving it to meets this summer. The last meet I attended, I walked off with two first prizes — one for the best in my class and the other for the best car out of the 125 cars in the meet. I must admit, however, that I did not have too much competition as mine was the only steam car at the meet. Now I am really getting started on the restoration of my 1909 Cadillac and hope to have it on the road by next summer.' Well done, Henry! Not too much personal news. Our family — two boys, wife, and I — spend our summers at our old country house in the Berkshires — Rowe, Mass. Our older son Wesley has just been elected varsity captain for football at our Hopkins Grammar School."

Bill Drummey continues in the news. In October, the Haverhill (Mass.) *Gazette* had a follow-up article on the work done by Bill and his company on the new intermediate John Greenleaf Whittier school. To get an idea of the kind of things Bill is thinking about these days, here are a few excerpts from the article: "Throughout the school, gay colors have been selected to get away from the intangible 'institutional feeling' and to help morale. Yet this coloration will reduce glare and reflect lighting agreeably. All interior finish surfaces are installed bearing in mind durability and ease of cleaning. Each child is provided with a complete change of air every minute. The clothes lockers, kitchen equipment, and movable dividing partition in the gymnasium are under separate contracts and are not yet in place. Features of the classrooms include forced warm air ventilation, lavatories in each room, movable furniture, sound-deadened ceilings, extentive storage facilities, zoned heating, two separate means of egress each, closet for the teacher, and generous blackboard and tackboard surfaces. Artificial lighting is by independently controlled fluorescent fixtures that will give plenty of light for working, even at night. With economy in mind, the exterior has been kept as simple as possible and is devoid of any ornamentation." One of the best features of the article is an excellent reflective picture of Bill himself. Ask to see it at the coming reunion.

In the last issue it was mentioned that the 1958 Silver Stein Award was to be presented to Steve Brophy by the M.I.T. Club of New York, but the affair came off too late for coverage in our last notes. Now we have from Joe Barker a first-hand account of the annual dinner and Silver Stein Award held in the Biltmore Hotel on November 17. At the special tables for 1916 men were Mr. and Mrs. T. D'Arcy Brophy, Mr. and Mrs. Joe Barker, Mr. and Mrs. Arthur Caldwell, Walt Binger and his son, Herb Mendelson, Jim Evans, and Dick Rowlett, all from the New York area. Steve Whitney came down from Boston, Ray Brown from Niagara Falls, and Al Pizzorno from Memphis. At the last minute, due to bad weather conditions in the air, Ralph and Sibyl Fletcher had to cancel their flight and Francis Stern and his wife couldn't get down from Hartford. Because of their recent move to Boston, Steve and Janice Berke received the notice of the dinner too late to come.

Joe writes: "Dean Penn Brooks'17 [Dean of the School of Industrial Management], as toastmaster, paid richly deserved tributes to Steve Brophy's many contributions to the New York M.I.T. Club, to M.I.T., and to public service throughout the nation. So, too, did then-Acting President Stratton of the Institute, who came to New York especially for this presentation. Dr. Killian, who planned to come until the weather made his flight from Washington impossible, sent his tribute to Steve. Dr. John Gardner, President of the Carnegie Foundation, gave an inspiring address on the problems facing our country and our educational system in meeting the forceful challenge of the Russians. He paid high tribute to M.I.T. for the quality and forward looking vision of its educational and research policies. In receiving the Silver Stein, Steve complemented Dr. Gardner's address by citing his and Jessie's experiences during their recent round-the-world trip, stressing the seriousness of the Russian challenge to our American system. Following the banquet, 1916 had a class party at the Biltmore for the Brophys. Here the many congratulatory telegrams and letters from the 1916 classmates who couldn't attend were given to Steve. He and Jessie were deeply moved by these affectionate regards from the Class."

The M.I.T. Club announcement gave the following information regarding Steve: "An outstanding authority on marketing and sales promotion, Mr. Brophy has found time from his duties as a top executive, later president and then chairman of the board of Kenyon and Eckhardt, one of the country's leading advertising agencies, to take part in numerous nonbusiness activities. Here are a few to indicate his wide interests in educational, charitable, and civic affairs: president, M.I.T. Club of New York, 1921–1922; member, committee on development (M.I.T.); life member, the Corporation (M.I.T.); trustee, Roosevelt Hospital; trustee New York University-Bellevue Medical Center; president, Society for the Facially Disfigured; past chairman, Public Relations National War Fund; past chairman, Public Relations, United Service Organization; former trustee, village of Scarsdale."

As most New Englanders know, Frank Ross was elected to the Connecticut Golfing Hall of Fame in 1958. To those of us who have a negligible difficulty in keeping an up-to-date count of their lifetime number of birdies, Frank sure is someone we're proud to say we know. He writes from his winter address: Canterbury Court, Naples, Fla., that he has little to add to the news that he's on an advisory and consulting basis and will retire in June when he reaches the 65-year mark.

Word from Joe Meigs says he hopes that any 1916 man passing through

Sharon in northwest Connecticut will drop in to say hello. Joe has been laid up with a heart ailment for a long time. Says the fact he is still alive is due wholly to his good wife, a classmate of Vannevar Bush at Tufts. Joe's son is a commander in the U.S. Naval Air Force in charge of an airplane carrier. We know Joe would especially appreciate a note or a letter from any of you — just address correspondence to him at Sharon, Conn.

Back in August, we received a card from way up in the Andes in Chile — Laguna del Inca, Portillo — showing plenty of snow between ragged shaggy mountain tops. It was from — you guessed it — Sibyl and Ralph Fletcher and was a view from their hotel window at 9,300 feet elevation, bearing the message: "Skiing is fine. Wind hard to get the first few days, then O.K. Best wishes." How about that?

For some time we've been dinging Joe Barker for an account of his three months' travels last spring, with his wife and his son, as he carried a sparkling message on American research to many official research councils throughout Europe. Joe has favored us with a story, part of which is given here. "We were most graciously entertained in Lisbon by our classmate Joao Correia and his charming wife. They took us to all the famous sights in and around Lisbon. Their intimate knowledge made the visits extremely enjoyable and instructive of the background of an area so rich in history. Added to this we enjoyed their hospitality at the most famous eating places and enjoyed the *fados* singing so unique to Lisbon. Joao has built one of the outstanding engineering firms in Portugal.

"Leaving Lisbon we drove into Spain, visiting Mérida, Sevilla, Córdoba, Granada before arriving in Madrid, where I spoke before the Consejo Superior de Cientos (National Research Council) under the auspices of our U.S. Embassy. In motor trips out from Madrid we visited Toledo, El Escorial, and the new cathedral memorial to the Lost People of the Civil War, built by General Franco. It is hewn out of a solid rock mountain with vast side chambers for the burial places of the dead, military and civil. The mountain is surrounded by a gigantic stone cross which towers some 500 or 600 feet over the floor of the cathedral. From Madrid we motored via Valencia on the Mediterranean Coast to Barcelona, where the M.I.T. Club of Spain under the leadership of José M. Bosch-Aymerich (Course XV, S.M. '46) held a delightful dinner for us after my talk. Bosch-Aymerich is one of the outstanding architects and engineers in Spain and is presently engaged in designing and preparing to build a tremendous skyscraper office and business structure in the very center of Barcelona. We spent three delightful days with the Bosch-Aymerichs, visiting the sights in and around Barcelona. Then we drove north along the Costa Brava into southern France to Cannes, Nice, and Monte Carlo; and after four pleasant days in Cannes we crossed by the Grand Corniche into the Italian Riviera on our way via Genoa to Rome, where I again spoke under the auspices of our embassy before the Italian National Research Council. We arrived the day before the opening performance of the Rome opera, but our concierge secured excellent tickets for us. From Rome we motored to Naples to visit Herculaneum, Pompeii, and the famous Amalfi Drive around the Sorrento Peninsula — experiences we will never forget. Then back to Rome to meet with Sibyl and Ralph Fletcher, who had come on their skiing vacation in Switzerland with three Boston friends. The eight of us 'did Rome' and left a true 1916 trail to the best restaurants and night clubs!

"Reluctantly we left Sibyl and Ralph and motored to Venice, stopping to visit Pisa, Florence, Bologna, and Padua on the way. Four of the wettest days of our entire trip were spent in Venice, of all places. Each day we said, 'Well, it can't rain tomorrow and so we'll stay another day'; but finally, completely discouraged, we left for Milan via the Italian lake region and on to Switzerland. We had planned to revisit our favorite resort area in the Berner Oberland above Interlaken at Grindelwald, but the delays in Venice prevented this. I had arranged nearly three weeks of appointments in West Germany with some of the universities where Research Corp. has made research grants supported by the income from our German patents on Vitamin B_1. These, plus another embassy sponsored talk at Bonn, meant that our time schedule had caught up with us. But radiating out from Frankfurt am Main, these visits took us to many of the important West German cities and all along the Rhine from Basel to the Holland border." The rest of Joe's story, including visits in Holland and to the World's Fair, is being saved for later.

In our last issue we made a last minute announcement of the death of Tom Holden on November 3 at the Engineer's Club in New York. We since have collected an enormous amount of material on his career. Born in Dallas, Texas, Tom started as a mathematics instructor at the University of Texas and later, 1913-14, at M.I.T. (did you know that?). From 1916 to 1918 he was in practice as an architect in Boston and Akron, Ohio. The story of his career is perhaps best summarized in the November issue of *Building Business,* a monthly bulletin published by his company, the F. W. Dodge Corp., publishers of magazines, bulletins, catalogues, and other material for the building industry. A paneled article reads in part: "Thomas S. Holden — executive, mathematician, architect, economist, statistician, and one of the best friends the construction industry ever had — passed away suddenly on November 3, 1958. It is characteristic of his life that up until a few moments before his passing, he had been busily engaged in plans for presenting his outlook for 1959. His eyes were always on the future. Most of our readers knew Mr. Holden — personally, through his speeches, or through his writings. We cannot begin to catalogue his achievements or do justice to his good deeds. During most of Mr. Holden's life, he was associated with F. W. Dodge Corp. Beginning in 1919 as chief statistician, he later became vice-president, and from 1941 to 1953 he was president. In 1953, at an age when many men would be content to retire, Mr. Holden became vice-chairman of the board, and went right on working in his chosen field. Mr. Holden was a Gentleman of the Old School, respected — and loved is not too strong a word — by his host of friends and colleagues. Yet his outlook was always young, and even exuberant; more than once, with a smile, he chided his juniors for the staid 'conservatism of youth.' Mr. Holden's faith in the future, and in the growth potential of America, was undying — literally undying in the sense that he instilled it so strongly in those of us who must carry on for him. Construction has lost a patriarch."

Word from Francis Stern said he was planning to leave for the West Coast just before Christmas. Their daughter, son-in-law, and two grandchildren live in Los Angeles, and they generally go out and spend a couple of months with the younger generations every winter. Says Francis: "I'm trying to find someone to drive my car out, because I find at this time of year the weather is a bit uncertain and I'd rather have someone else gamble than to find myself stuck and be late in arriving in time to help Santa Claus down the chimney. Accordingly we generally fly out but always drive back, stopping over I hope as before in Arizona and again in New Orleans on our way back. There isn't much new; I am now looking for an opportunity to retire from my retirement, because all the programs I've taken on in the last five years keep me twice as busy as business ever thought of doing."

This concludes the notes for the current month. Please feel guilty if you haven't been quoted in the column during the past 12 months, and accordingly send in your paragraph now. If you are in New York early in any month, remember 1916 has a table for lunch at the M.I.T. Club of New York quarters at the Biltmore, on the Thursday following the first Monday in the month — at 12:00 noon — right next to the Grand Central Station. Also plan now to attend the 43d reunion at the Cape, June 12, 13, and 14. — HAROLD F. DODGE, *Secretary,* 96 Briarcliff Road, Mountain Lakes, N.J.

1917

When one of our classmates receives plaudits from a group of glamorous young women, it really becomes news. To those who do not see the Boston newspapers, try to picture to yourself the following newspaper photograph which appeared in the *Boston Herald* of Friday, November 14: a very distinguished looking man seated in a chair, holding in one hand a copper "Oscar" and in the other a scroll, and with a broad grin spread across his face. Directly in back of the gentleman a glamorous young lady is placing a crown on his head. Standing beside the young lady doing the crowning are two other smiling gals. The newspaper headline reads as follows: "'Considerate' With Sense of Humor, Secretary Says Watertown Executive 'BOSS OF THE YEAR.'" The picture is captioned as follows: "Best Boss of the year, Raymond H. Blanchard of Melrose. At regal ceremony, from left, were Miss Mary Conroy, Blanchard's secretary; Miss Kathryn Faulkner; and Miss

Beatrice Olen, President of Beacon Hill Chapter." (National Secretaries Association). The article goes on to say: "What makes a good boss? 'Well,' said Miss Mary Conroy — who should know since she has the best Greater Boston boss of the year — 'He must be considerate and give his secretary credit for having a mind of her own. He lets you get things done your own way.'

"But he apparently must have a good sense of humor, too. At least her boss, Raymond H. Blanchard, rubber executive, last night had one as he got a good-natured ribbing from about 50 other executives and a crown from Boston secretaries as 'The Boss of the Year.' Only a boss of Blanchard's experience could have weathered so well the banter from his subjects at the regal ceremony which was climaxed by a gold crown placed squarely on his head. 'Be natural — hold her on your knee,' a voice shouted from among the 132 diners. Unflustered, Blanchard turned to Miss Conroy, who stood beside the 'throne' on the stage, and said: 'We tried that years ago — but she's too heavy.'

"There was a serious side, of course, including the presentation of a scroll and a copper 'Oscar' to Blanchard. But most of the moments were merry, with his friends in the audience singing 'All Alone On My Little Throne' as a parody to a popular song of yesteryear."

Congratulations, Ray. We did not realize that you had such a way with the women, but I guess that is a sign of a well balanced man.

Irving B. Crosby certainly gets around the world. This time one of his projects in India has received publicity: namely, the Bhakra dam built in a narrow river gorge where the dark foothills of the Himalayas sink toward the sweltering Punjab plain of northwest India. The news release states that at Bhakra on the Sutlej River, the Indian government is pushing round-the-clock work to completion on one of the biggest, most ambitious power and irrigation projects in the world. Irving writes: "The dam is a massive concrete gravity dam whose height is 740 feet, measured from the bottom of the deepest cutoff wall, and 680 feet from the general foundation."

Irving was a member of the consulting board that planned the building of the dam. The board was made up of four other Americans with an Indian engineer as chairman. Irving states that early in January, 1959, he is leaving on his ninth trip to the Philippines.

News has been received of the death of another of our classmates, Arthur Clifford Carlton, on November 12, at 63 years of age. Arthur was director of the Franklin Institute Museum in Philadelphia. The news release further states: "From 1919 to 1932 he worked in metallurgy for industrial plants in North and South America. In 1932 he joined the staff of the Chicago Museum of Science and Industry, where he later became curator of geology and mineral industries. Ten years later, Mr. Carlton became a civilian official for the Chicago Ordnance District. For his work he received a meritorious civilian service citation. He was a member of the American Institute of Mining and Metallurgical Engineers and the American Society of Metals. He leaves his wife, Mabel."

The *Electronic News* of November 17 records the promotion of Dr. Leo I. Dana, Vice-president of Research and Development of the Linde Company (Division of Union Carbide Corp., New York) to the post of vice-president of Technology. Dr. Dana will be responsible for evaluation of Linde's technical program.

Another business change concerns David E. Waite, who has held the position of chief product engineer of the Wallace Barnes Division, Associated Spring Corporation. He has been assigned to the factory manager's staff to work on special problems. He has been with the Wallace Barnes Division since 1927 in various positions, including assistant metallurgical and research director, superintendent of the spiral division, and most recently as chief product engineer since 1951.

Here are a few random notes: November was an eventful month for Mr. and Mrs. Ralph H. Sawyer of Framingham, Mass. It was a family party representing the first time that the entire Sawyer family with children and grandchildren had been together for 11 years. Their daughter came from Shreveport, La., and their son from Ketchikan, Alaska.

A telephone call from Gus Farnsworth informed us that although he had had a short stay in the hospital for — as Gus said — "one of those ailments common to men of our age," he is back at his desk as a partner of Coverdale and Colpitts in New York City, and gradually getting back into the pace that is common to men in his profession.

The monthly class luncheon of 1917 men at the M.I.T. Club of New York — Biltmore Hotel — had a pleasant surprise by welcoming William A. Sullivan (Sully to his friends) back from Japan. Sully is not publicizing his return because he and Mrs. Sullivan want to look for a home in Connecticut where they can "stay put" after years of living here and there all over the world. He says that if people discover his whereabouts he will probably be besieged with government and other jobs. We will be glad to have Sully back for reunions and class get-togethers. The New York luncheon brought together the following: Ray Brooks, Bill Neuberg, Eddie Aldrin, Ben Levey, Dick Loengard, Joe Littlefield, and Master of Ceremonies Dix Proctor.

Today's Best Smiles follow: A psychiatrist advised his timid patient to assert himself. "Don't permit your wife to bully you. You go home and show her you are the boss." The patient went home, slammed the door loudly, seized his wife and snarled, "From now on, you're taking orders from me, see? I want my supper right this minute, and when you get it on the table, you go upstairs and lay out my clothes, see? Tonight, I'm going on the town with the boys and you're going to stay home. And do you know who's going to dress me in my tuxedo and black tie?" "You bet I do," replied the wife, "the undertaker!"

The indignant minister looked hard at one of his parishioners. "I heard you went to a ball game Sunday instead of coming to church." "That's a lie," the parishioner cried, "and I have the fish to prove it." —

W. I. MCNEILL, *Secretary*, 107 Wood Pond Road, West Hartford 7, Conn.
STANLEY C. DUNNING, *Assistant Secretary*, 21 Washington Avenue, Cambridge 40, Mass.

1918

In the hope of thinking wisely and well men delight in conferences, most especially of the scientific or industrial variety. Early in December a conference on Reliable Electrical Connections was held at Dallas, Texas. Among the panel members was Dr. Franklin H. Wells, once of Westinghouse Airbrake, then of Bendix Products, of American Machine and Foundry Company, and presently Director of Research for Aircraft Marine Products at Harrisburg, Pa. We note at the bottom of the letterhead this gentle thought: "Today your safety may be threatened, your time wasted, your fun spoiled, your work made harder by faulty electrical connections."

Back in the days when we had one passenger train a day in our town, it was affectionately known among the cognoscenti as the *Flying Snail*. By such channels we have received an October document as follows: "The Secretary of the Army today issued the following press release: Secretary of the Army, Wilber M. Brucker, announced today the appointment of Dr. Harold C. Weber as chief scientific advisor (consultant) to the Chief of Research and Development. Dr. Weber has been professor of chemical engineering at the Massachusetts Institute of Technology since 1921. He has been the recipient of many honors as a civilian and as Army officer during both world wars. For several years, Dr. Weber has been a member of the Army Scientific Advisory panel and chairman of the chemical, biological and radiological subpanel of that organization. He has had wide industrial experience as a consultant in the textile, electronic, heavy chemical, and petroleum industries; is the author of numerous technical articles and of the textbook, *Thermodynamics for Chemical Engineers*. Dr. Weber also contributed the sections on thermodynamics and refrigeration to *Marks's Mechanical Engineers' Handbook*.

"The new chief scientific advisor was graduated from M.I.T. in 1918 with the degree of bachelor of science in chemical engineering and from the Eidgennosiche Technische Hochschule, Zurich, Switzerland, in 1934 with the degree of doctor of science. During World War I he served as a second lieutenant in the aviation section of the Signal Corps, and later in the Chemical Warfare Service. During World War II he was technical advisor to the Chemical Warfare Development Laboratory at M.I.T. For his work in that war, he was awarded the Presidential Certificate of Merit; and for his work with the Chemical Corps since 1945, he was awarded the Chemical Corps' Certificate of Achievement. For the last five years, he has been chairman of the advisory committee to the Chemical Corps. Professor Weber will continue to serve on the M.I.T. Faculty."

Through the kind offices of C. A. Clarke, Secretary of the Class of '21,

comes news of Phil Dinkins' elevation to the presidency of the General Aniline and Film Corporation; he was previously vice-president and general manager of the company's dyestuff and chemical division. From 1946 to 1955 Phil was president of the Jefferson Chemical Company, and before that he was an executive with American Cyanamid. The old dimple in the chin is still there, and so is the serious now-you-show-me expression. We think the mustache is a distinct addition. — F. ALEXANDER MAGOUN, *Secretary,* Jaffrey Center, N.H.

1919

Aubrey Ames stopped in at our office on his way from California to Florida for the winter months (an exchange deal with a Florida resident, we hear); and I am sorry to have missed seeing him (I was out of town, too), for 40 years is a long time between chats, at best. He'll be back home in San Francisco by the time you read this. Call again, Aubrey!

Daniel Brown took time out from his multitude of tasks as head of brand new Lebanon College to write a cardful of news. The college, he says, is slowly progressing; and he now can understand "the terrific problems of the small college, particularly on finance." He thinks back to the founders of M.I.T. and what they had to hurdle, he adds. His son George received his degree from Harvard last June and is now an associate professor of education at the University of Delaware. Good to hear from you, Dan; good luck with your college affairs and personally.

George Bond writes that he is somewhat busy, and so it would seem. In addition to his job, he's active in the Kiwanis, Y.M.C.A., Boy Scouts, building and loan — plus church work and much more. How do you do it all, George? In addition he has just finished putting his four children through college — two sons and two daughters; and both daughters married within the past two years. He writes also that he saw Harry Kuljian recently and had a good talk with him. Harry, he said, is continuing the work he started some few years ago of helping to educate a large number of his fellow countrymen in Armenia. And Harry has always been generous in his gifts to M.I.T., having established a scholarship and made other helpful gifts. George says: "Our Class should be very proud of him for what he has accomplished, and for his generosity to M.I.T. and many others." To which we all agree, I'm sure.

Can't keep Charlie Chayne out of the news. He and the engineer in charge of the vehicle development group at General Motors have just taken out a patent for a torsion spring rear suspension.

Had a nice letter from Edgar (Dutch) Seifert out in Chesterton, Ind. (sort of suburban to Chicago), where he is hard at work — at the job of soliciting donations for our 40th reunion gift drive among many other activities that put demand on his time. If you are in Dutch's territory, and he calls on you for a pledge . . . GIVE. That goes for all of you, wherever you are. We've got to go over the top on the drive. Don't let M.I.T. and our Class down; we're counting on YOU.

Dr. William J. (Bill) Farrisee passed away at his home, Alexander House, in Castle Point, Hoboken, on November 30. He had been dean of men at Stevens Institute of Technology since 1955, and was likewise active in many outside civic and educational programs.

Earle Richardson writes from Rochester, N.Y., that all goes well with him and that he made a fast trip to M.I.T. a bit ago. Sorry you didn't get into New York, Earle. Include that in your itinerary next time. Drop into the M.I.T. Club and say hello, have a drink, and talk over old times with some of us.

Jim Reis at South Pasadena writes that everything is fine with him. He was out of the country for some time (where he didn't say) but is back at the old stand once again.

Two new addresses for you: George Inglis, formerly in Colorado Springs, now at 7 Parker Street, Newton Center 59, Mass. Let us hear from you, George. Robert Insley has moved from Detroit to 900 South Shore Avenue, Chicago. How about a card full of news, Bob?

That's all for this time. Let us hear from you ALL . . . and OFTEN. — E. R. SMOLEY, *Secretary,* The Lummus Company, 385 Madison Avenue, New York 17, N.Y.

1920

Herb Fairbanks has been appointed consulting civil engineer for Ebasco Services, Inc. He has been a project engineer with Ebasco on a large number of hydroelectric and thermal electric generating stations and has participated in the selection of sites for several of the largest recently built thermal electric stations. His work in the field of hydroelectric plant design included the Wyman Dam of the New England Public Service Company and the Possum Kingdom dams built by the Ambersun Dam Company. He is a member of the American Society of Civil Engineers, the Engineering Institute of Canada, and the international commission on large dams.

Samuel Schenberg has been appointed science director of New York public schools. He is regarded as being largely responsible for the stepped-up science program of New York City schools. Sam has been teaching ever since he graduated, starting as a teacher of chemistry in Bay Ridge High School, later becoming chairman of physical science at Lafayette High School, and then with the board of education headquarters as science supervisor. He also holds a law degree from Brooklyn Law School and an M.A. from New York University. The *New York World Telegram* says: "There hasn't been much in the way of scientific development, science education, and science teacher training in this city in recent years in which Mr. Schenberg has not played at least some part, often the leading roll."

Carleton Proctor is now at 72 Eustis Avenue, Wakefield, Mass. Arthur Morley is in Hendersonville, N.C.

Your Secretary recently received a copy of the Alumni Association Directory and notes that our Class is pretty well represented in Alumni affairs. Presently active on the Alumni Council are Ed Ryer as our Class representative, and M.I.T. Club representatives as follows: Perk Bugbee, Akron, Ohio; Al Burke, Charleston; Oswald Cammann, Dayton; Jim Gibson, Knoxville; Harold Bugbee, Havana.

Ed Ryer is also Alumni Fund board chairman and a member of the audit and budget committee. I hardly need mention that Al Burke is our class agent on the Alumni Fund. Ed Burdell is on the departmental Visiting Committee for Regional City Planning and David Brown on the Naval Architecture and Marine Engineering Visiting Committee. Members of the M.I.T. Educational Council include Harold Hunter of Rome, Ga.; Archie Cochran of Louisville; John Bowman of Buffalo; Frank Bradley of Passaic; Walt Sherbrooke of New York City. — HAROLD BUGBEE, *Secretary,* 7 Dartmouth Street, Winchester, Mass.

1921

The month of February will forever be associated with the event of a lifetime just a year ago, when the members of the M.I.T. Club of Cuba rolled out the red carpet to be such hospitable hosts to the reunion of the Class of 1921 in Havana. Anticipating this happy anniversary, it has been a great pleasure to review the saga of the 1921 Week End in Havana in both words and pictures, always a topic to bring back wonderful memories and a particularly cheerful subject on which to reminisce during the extremely frigid spell in which these notes are being prepared.

Concurrent with their preparation has come a sad sequel to the Havana story. Letters from Phil Nelles, Bob Miller, and Chick Dubé have just arrived with the news of the passing on November 1, 1958, of Mary Alice Nelles, who accompanied Phil to most of our Alumni Day parties and to the Havana reunion. We know we speak for all the members of the Class and also for our honorary members in Cuba in expressing sincerest sympathy to Phil, his daughter, and her family. We last saw Phil and Alice at last June's Alumni Day and especially recall an enjoyable chat with them during the social hour preceding the evening banquet. Bob Miller suggested making copies of the color pictures he took in Cuba, which has been done. Says Bob: "This is a shock, and I am glad now that I took all those pictures." Chick Dubé recalls that he and Maida were with the Nelleses when all four were royally entertained by Ann and Rafael Laredo'44 in Havana and adds: "Our few days together with Phil and Alice showed how devoted they were to each other. Such an event brings us up pretty short, and I am glad that our Class is pressing forward for the big 40th reunion." Chick remarks that he and Maida are getting so much enjoyment from the six grandchildren.

Phil's letter brings us up to date on what has gone on since we all regretfully took leave of beautiful Cuba last February and says, in part: "From Havana, we flew to Miami, where we were picked up by friends who live in Pompano Beach. We spent a week there and then flew north. All our flying was perfect, which was particularly good since it was Alice's

first air experience. We opened our Cape Cod cottage early in May and settled down for holidays and summer week ends there. The high light of the summer was the renewal of acquaintances on Alumni Day with those who were with us on the Cuban trip. Early in August, Alice caught a bad cold which developed into severe pain. Tests, X-rays, and a hospital check-up were followed by two operations. I brought her home in September. In October, we spent a two-week vacation on the Cape and came home when steady rain and bad weather made Alice's breathing difficult. November 1 became the fateful day which ended a life devoted to helping the less fortunate. A good pal, wife, and homemaker, her greatest pleasure outside of our own family was in Class of 1921 and Alumni Day affairs." Phil concludes with an expression of good wishes to all.

As we go to press, big news has arrived via the daily newspapers and followed by a warm letter from our beloved President Jim Killian'26, who is on duty in Washington as President Eisenhower's Special Assistant for Science and Technology. As of the date of his return to Cambridge, Jim will assume the duties of the Chairman of the Corporation of M.I.T. Effective January 1, 1959, Dr. Julius A. Stratton'23, who has been Chancellor and Acting President, became President of the Institute. Van Bush'16, who has been Chairman of the Corporation for the last two years, was elected Honorary Chairman of the Corporation. On behalf of every member of the Class of 1921, we extend heartiest congratulations and good wishes to these three outstanding friends and administrators; and we reaffirm to them renewed dedication to our mutual interest in the advancement of M.I.T. and its continued contributions for the benefit of all mankind. We stand ready, as one man, to do all within our individual abilities to serve and aid these leaders in maintaining Technology in the forefront as an active, aggressive, and vital factor in science, technology, and the humanities.

Francis T. Hill has been promoted to resident manager in Boston for the Maryland Casualty Company. Frank has been assistant resident manager since 1950. He entered the insurance field with the Maryland company following graduation with us in Course II, starting as a casualty underwriter and becoming manager of the casualty department in 1937. Arthur E. Raymond has been elected senior vice-president in charge of engineering of Douglas Aircraft Company, Santa Monica, Calif. The November, 1958, issue of the *M.I.T. Newsletter* confirms Monday, June 15, 1959, as the date of Alumni Day 1959.

We wish to express an official welcome to Webster K. Ramsey, Course II, who has transferred his Class affiliation from 1922 to the Class of 1921. Web is engineering manager of the U.S. Envelope Company, 75 Grove Street, Worcester 5, Mass. We'll look forward to the opportunity for a personal greeting on next Alumni Day. Captain Elliott B. Roberts, Chief of the Division of Geophysics, U.S. Coast and Geodetic Survey, has written an article entitled "The Coast and Geodetic Survey Looks Ahead" for the November, 1958, *U.S. Naval Institute Proceedings.* Elliott has dramatically summarized the present extensive and increasingly widening activities of this 150-year-old organization in a most interesting fashion. Resurveying two and one-half million square miles of coastal waters, completing the initial surveys of our extensive coastline, now extended to include the state of Alaska, hydrographic investigation for defense and commercial purposes such as petroleum searches in the Gulf of Mexico and in the Pacific, and for harbors to accommodate proposed ships of 45- to 50-foot drafts — these and many more expanding problems face the Survey today. Elliott, who is affectionately known as "Mr. Coast and Geodetic Survey," is the author of many articles on geophysics and surveying, an excellent photographer, an inventor of note, and variously a navigator, executive officer, and commanding officer of Coast and Geodetic Survey ships on hydrographic and geodetic surveys, especially in the Aleutian Islands.

Jack Rule, Dean of Students at the Institute, has written for the November, 1958, Bulletin of the M.I.T. Educational Council an excellent discussion of the important significance which Technology places on living for four undergraduate years in the campus environment. Jack outlines the housemaster system, now in its embryo stage, which is devised to accompany the Institute's rapid change from a commuting to a residential institution. Worth reading are his comments on the benefits brought to the M.I.T. community by the Hayden Library, the Kresge Auditorium, the Chapel, and the resident staff of religious leaders of four faiths. The well prepared summaries and statistics presented by the Admissions Office on the freshman class of 938 that entered Technology last September do not reveal any sons or other relatives of members of the Class of 1921. This is the second consecutive year in which there have been no additions to the Second Generation Club of 1921 at M.I.T. For the record, the first sons of members of 1921 were in the Class of 1942; and with the exception of the Classes of 1945, 1959, 1961, and 1962, there have been additional members in the 17 other undergraduate classes of these last 21, besides a number in the Graduate School. The year by year attendance built up to a maximum in the Classes of 1950 and 1951 (seven in each) and has since slowly decreased. Because graduate and transfer students are not included in the personal data furnished by the Admissions Office, will you please advise your Secretaries of sons or other relatives in these categories who are now attending or who have attended Technology.

Dug Jackson of the Ballistic Laboratories, Aberdeen Proving Ground, Md., writes: "Last June, Betty and I missed Alumni Day because of our trip to the University of California, Berkeley, to attend the annual meeting of the American Society for Engineering Education. We flew to Denver, visited with relatives, drove a Hertz car [Al Shaughnessy will please note—Cac] to Cheyenne and took the train to Berkeley, which afforded a scenic trip through Utah. On our return, we saw northern Nevada during the daytime and had an interesting stopover in Colorado Springs with relatives. For a few days later last summer, we had all of our children and grandchildren, except two eldest grandsons, at our cottage in Yarmouth, Maine. In November, we visited my mother, who suffered a broken arm, and inspected the elevator newly installed in her Cambridge home. On our return from the Havana reunion last spring, we addressed a letter of appreciation to Sr. and Sra. Antonio Badia Fontanals'43 at the address listed in the booklet of the M.I.T. Club of Cuba, but the letter has been returned. Can you give us the correct address?" Will our friends in Cuba be so good as to supply the information to your Secretary or directly to Dugald C. Jackson, Jr., Tetrastremma, Harmony Hills, Darlington Road, R.F.D. 1, Havre de Grace, Md. It is a great source of satisfaction to see how many fast friendships have resulted from the Havana week end; and we certainly hope they will flourish, without difficulties in the channels of communication.

Herbert A. Kaufmann was a welcome visitor during November. By the time this reaches the printed page, he will have retired from the vice-presidency of the New York sheet metal firm of Treitel Gratz Company, Inc., and will have joined with his wife, Millie, in operating the Mildred and Herbert Kaufmann shop at Scotts' Corners, Pound Ridge, N.Y., via Exit 35 or 37 from the Merritt Parkway to the intersection of Trinity Pass and Westchester Avenue, Route 394. Here Herb and Millie have six acres, a lake, and a thriving business in American antiques, early American furniture, and accessories. Herb says he occasionally sees Bob Felsenthal, who heads his own manufacturing firm.

A reminder of the inspiring letter you received from Class Agent Ed Farrand, dated December 1, 1958, and his request for your co-operation in supporting this year's amity fund and the five-year total of $200,000 which the Class has set as its gift to the Institute at our 40th anniversary on Technology's 100th birthday in 1961. We know you will want to heed Ed's sincere appeal and, if you haven't already taken action, please do so now — for Technology, for your continued membership in the Alumni Association, and for a renewal of your subscription to The Review. The amity fund interim report indicates a greater response so far this year in both contributors and amount, as well as an increasing trend towards year end, which is an interesting reversal of previous years' experience.

Stephen L. DeStaebler, Princeton'54, son of Herb and the late Mrs. DeStaebler, married Dona M. Curley, daughter of Mr. and Mrs. Donald E. Curley at Pacific Palisades, Calif., on December 27, 1958. The young people make their home in Malibu, Calif. Joe Wenick and your Secretary attended the November meeting of the M.I.T. Club of Northern New Jersey, which was chairmanned by Sumner Hayward, President of the Club. With the centennial of M.I.T. in the not-too-distant future, why wouldn't it be good public relations for every Tech man to write, phone, or wire to radio or television stations wherever college songs are played

and call to their attention that *our* "Stein Song" is truly a college song and should be identified with Technology and included — particularly because it has transcended most college songs and has been adopted by people everywhere as a traditional piece of Americana. Its lyricist, Frederic Field Bullard'87, and its composer, Richard Hovey, collaborated on other traditional American music.

Dr. Daniel P. Barnard has now moved to his newly built home in Bozman, Md., where he receives mail addressed to Box 313. He has retired from the Standard Oil Company of Indiana, Chicago. Donald S. Cheney has moved from Hamden, Conn., to a new home at 76 Blackley Road, Stamford, Conn. George A. Chutter continues his business headquarters in Jersey City, N.J., and lives on Middle Haddam Road, Portland, Conn., appropriately near Route 6-A. James F. Curtin reports his home address as 13200 Fairchild Road, Cleveland 20, Ohio. Colonel Holland L. Robb lives at Sourwood Drive, Chapel Hill, N.C. James S. Parsons has transferred his home from New York City to become a New Jersey neighbor at 21 Larchdell Way, Mountain Lakes. (Another appropriate address; Joe Wenick please note.) New addresses have also been received for Thomas W. Bartram and David P. Wheatland and are available on request to your Secretary.

We regretfully record the passing of Richard Clement Poole on June 14, 1958, and express sincere sympathy to his family. Born in Cambridge, Mass., November 12, 1899, he prepared for Technology at Dorchester High School. At the Institute, he was a member of Alpha Tau Omega, the Mechanical Engineering Society, the freshman relay team, field day relay team, and Technique electoral committee. During World War I, he was a sergeant in the Students' Army Training Corps at M.I.T. Following graduation in Course II, he joined the Worthington Pump and Machinery Corporation and served in engineering capacities at the East Cambridge and Buffalo plants. He was later associated with the Carborundum Corporation in Niagara Falls, N.Y., as a safety engineer and then became assistant manager of the operating department of Frosted Foods Corporation, New York City. Most recently, he had been packaging engineer of General Foods Corporation, White Plains, N.Y.

Calendar: Just four months to Alumni Day on campus in Cambridge, Monday, June 15, 1959. Bring your wife and family and join the large 1921 group for a full day of fun and fellowship. Just a little over two years to our BIG 40th reunion and M.I.T.'s whopping centenary celebration in 1961. Put it on your *must* list. Meanwhile, your Secretaries want to hear from you. Please write. — CAROLE A. CLARKE, *Secretary,* Components Division, International Telephone and Telegraph Corporation, 100 Kingsland Road, Clifton, N.J. EDWIN T. STEFFIAN, *Assistant Secretary,* Edwin T. Steffian, Architect, 11 Beacon Street, Boston 8, Mass.

1922

Great consternation in your Secretary's office was evident when no class notes could be found in the November Review although they had been sent in on schedule in September. They are included herein. A suggestion was made by Don Severance, Alumni Secretary, that acknowledgment be made of class members who hold official positions in the Alumni Association. A hasty check of the Directory acknowledges services as follows: Ted Miller and Fred Koch — Alumni term members of the Corporation; Ed Ayres, Warren Ferguson, Parke Appel, Robert Brown, Yard Chittick, Fred Dillon, Oscar Horovitz, Bob Tonon, Karl Wildes — members of the Alumni Council; Whit Ferguson — Alumni Fund board; Larry Davis — Departmental Visiting Committee; Elmer Sanborn, William Huger, Roberto Ottonello, Whitworth Ferguson, Norman Randlett, George Bailey, Claus Molbach-Thellefsen, John Liecty, Yoshinori Chatani, Robert Brown — officers of M.I.T. Clubs; John Liecty, Charles Brokaw, R. A. Stone, Robert Thulman, William Huger, Abbott Johnson, Fred Koch, Willard Purinton, Robert Brown, Everett Vilett, Whitworth Ferguson, Thomas Craig, George Dandrow, William Mueser, Dwight VandeVate, Edwin Gruppe, Paul Choquette, Randell Hogan, Philip Alden, C. Willis Stose, T. M. Taylor, John Williams, H. W. McCurdy — Educational Counselors.

James R. Hemeon, as senior mechanical engineer in Plant Engineering of General Motors, has been granted a patent for a hydraulic driving apparatus. Thanks to Clayt Grover your Secretary is now using a plastic covered razor blade cutter for opening Christmas presents. Clayt also recommends this for cutting free the purse strings and giving larger gifts to the M.I.T. Alumni Fund. George Dandrow's Johns-Manville Corporation received a glowing report in financial journals during November. George has not only expanded their goodwill but has increased their earnings over 1957. Crawford Greenewalt, President of DuPont, has been selected by the American Society for Metals as the recipient of the Society's 1958 Medal for the Advancement of Research. Cited for his "faith in research, for sponsorship of it at the executive level, and for his conviction that there is no substitute for enlightened technical work as a basis for technological innovation," he received his citation at the 40th annual National Metal Exposition and Congress.

We note that Parke Appel, our President, has moved from Belmont to Old Farm Road, P.O. Box 137, Dover, Mass.; Commander Donald Gross now lives in Asheville, N.C.; Kenneth Sutherland has also moved to Dover, Mass., on Dover Road; Gaylord Wood has moved to Fort Lauderdale, Fla.

Yard Chittick has sent a clipping telling of the death of David J. Abrahams of Swampscott, prominent Boston architect. He designed and constructed many great contemporary homes as well as several modern Jewish temples. He received many awards for his designs during his career. Our sympathy goes to his family.

A most encouraging report from the Alumni Fund as of December 1 indicates that the Class of 1922 again leads all others in number of special gifts with the average gifts this year steadily rising. Be sure to send that contribution in promptly to build up to the 40th reunion gift as the greatest any class has ever made to the Institute.

NOVEMBER NOTES — Your Secretary writes these notes while sitting in sunny old Buffalo on the eve of his departure for the mid-September Alumni Fund Conference. The accumulated summer's notes include thanks to Clayt Grover for his versatile Whitehead knife for making cutting remarks in the sign language. It's a gay blade. Clayt suggests we discuss holding our next reunion with the Class of '21 so that we might see additional friends. An announcement on June 5 from William B. Elmer introduces us to his 6 pound-12 ounce son, Edward Burns. Bill hurls defiance at his remaining classmates: "Will I be the last of the valiants?"

Alumni Day in June gave opportunity for many of us to get together at the luncheon and during the later cocktail party and dinner. Those attending were: Abrahams, David J.; Appel, Parke D. and Mrs.; Baker, C. Hall and Mrs.; Brown, Robert H. and Mrs.; Chittick, C. Yardley and Mrs.; Dandrow, George; Dillon, Frederick N.; Ferguson, Warren T. and Mrs.; Ferguson, Whitworth and Don; Freeman, William W. K.; Godard, G. Dewey; Horovitz, Oscar H. and Mrs.; Keenan, Joseph and Mrs.; Knight, Donald P. and Mrs.; Medalia, Leon S.; Miller, Theodore T. and Mrs.; Myer, C. Randolph, Jr., and Mrs.; Pierce, Marjorie; Potter, Winthrop F.; Pratt, Fearing; Randlett, Norman P., Mrs., and Marcia; Riley, William A. and Mrs.; Rosengard, Hyman L. and Mrs.; Rudderham, Charles G.; Shirey, Hugh M.; Spalding, Francis W. and Mrs.; Teeter, John H.; Thomson, Wilfrid M.; Vaupel, John L., Jr., and Mrs.; Williams, Maurice W. and Mrs.; Wing, Frank H. and Mrs. The general discussion of the day was the unfortunate automobile accident of Frederick S. Blackall, Jr., and his wife, Hazel. The sympathy of all of Fred's friends has been deeply felt in his loss of a lovely wife. The last news is that Fred has fully recuperated. We also extend our sympathy to Roscoe Sherbrooke for the loss of his young son.

Compliments to C. Ford Blanchard upon being awarded the degree of master of arts in Economics from the American University, Washington, D.C. This degree represented the climax of a postwar educational course and will assist Ford as head of the Finance Section of the Federal Power Commission in Washington. During the past year he has been the Commission's principal financial witness on almost a dozen rate cases. Christian W. Bertelsen of Dedham has been made manager of Bethlehem Steel Company's East Boston Repair Yard. He has been assistant to the manager for the past several years. Dr. John W. Strieder, a pioneer in the field of thoracic surgery in Massachusetts, was cited as the main speaker at the annual meeting of the Lowell Tuberculosis and Health Association. He is surgeon-in-chief for thoracic surgery in Boston City Hospital; the Sanatorium Division, Massachusetts Memorial Hospital; Newton Wellesley Hospital; and the Soldiers Home in Chelsea.

Special honors and an M.I.T. chair were presented to Oscar Horovitz of Newton for his fund raising activities for the Stein Club M.I.T. Freshman Scholarships. A brochure also announces four October and November lectures by Oscar at the Boston Camera Club of Newbury Street. The subject matter sounds especially interesting, covering basic motion picture photography.

Richard M. Rush of Winchester has been promoted to associate professor of physics at Northeastern University. He received his master's degree in Naval Architecture from M.I.T. and had previously taught at Tufts University. Reverend Burton G. Robbins is pastor of Methodist Church at Marlow, N.H. He has been active in American Legion and as a master of Warren Grange in former parishes. Announcement has been made of important work by Henry W. Coughlin of New York City for General Aniline and Film Corporation. This is the largest manufacturer of high quality dyes and intermediates in the country. Latimer F. Hickernell is making continuous headlines in his work as president of the American Institute of Electrical Engineers. His is an outstanding accomplishment in his profession. Dr. Crawford Greenewalt has joined a small group of prominent M.I.T. men among leaders of American industry and education who are sponsoring the American Chemical Society's three million dollar building fund campaign. This effort will be extended throughout the 152 local sections of the Society.

William L. Hyland was elected president of the Boston Society of Civil Engineers, the oldest engineering society in the country, at the 110th annual meeting. He is a partner of the firm of Fay, Spofford, and Thorndike, Inc., Boston. A note from Parke Appel advises that there will be a class meeting in Boston on Friday, September 12 for those in attendance at the dinner. Attendants will include: Yard Chittick, Fred Dillon, Oscar Horovitz, Harold Humes, Parke Appel, and Whitworth Ferguson. Don Carpenter also hopes to stay over after the Corporation meeting. The big news from Muncie, Ind., is in a resolution by the Delaware County Board of Commissioners. They have changed the name of Delaware County Airport to Johnson Field because of Abbott L. Johnson and his 30 years of effort to build a scheduled airline service to Muncie. Abbott qualified for the first private pilot's license in his county, he served on many committees and was president of the first aviation committee to build an airfield. He has supplied the leadership that has been so essential in obtaining the necessary funds, acquiring the property, successfully promoting the construction of an adequate public airport, and in obtaining a scheduled airline service. Abbott is also president of the Muncie Symphony Association, director of Indiana Manufacturers Association, vice-president and director of Glascock Brothers Manufacturing Co., and a member of the Naval Academy Board. In his spare time he is located at Warner Machine Products, Inc., in Muncie. Thank George Dandrow for the information. John H. Teeter appeared in a newspaper picture with Mrs. Teeter presenting a $5,000 Cancer Grant for the University of Alabama Medical Center, in Birmingham. His pretty wife is Christine Maguire of the famed Maguire sisters. Ted Miller, President of Grace's Polymer Chemical Division, is receiving much valuable publicity in the advanced work on his new plant near New Orleans. David M. Broudy announces the formation of law partnership with Ernest G. Montague at 122 East 42d Street, New York 17, N.Y. Samuel M. Segal has become executive vice-president of Filene's. He is a director of Faulkner Hospital, American Cancer Society, and Associated Jewish Philanthropies.

We received the following new addresses: Thomas E. Shepherd, 30 North Long Beach Avenue, Freeport, N.Y.; Dr. Karl E. Schoenherr, 7053 Western Avenue Northwest, Washington 15, D.C.; John H. Teeter, Damon Runyon Memorial Fund, Walter Winchell Foundation, 730 Fifth Avenue, New York 19, N.Y.; Herman F. Davies, Standard Oil Co. of California, Room 630, 320 Market Street, San Francisco 11, Calif.; H. Douglas MacDonald, 208 Mount Pleasant Avenue, Hanover, N.J.; George C. Maling, B.P. 143, LaBaule, Loire Atlantique, France; Percy B. Bass, 1 North Berkley Drive, Morrisville, Pa.; Hobart A. Fischer, Ashlar Drive, Goffstown, N.H.; Eliphalet N. Read, 6905 Maple Avenue, Chevy Chase 15, Md.; Daniel J. Reed, 10315 West Greenfield Avenue, Milwaukee 14, Wis.; Tom T. Freeman, The Texas Co., 720 San Jacinto, Houston 2, Texas; Roger S. Walke, 207 Roslyn Hill Drive, Richmond 26, Va.; Richards J. Bard, Poundridge Road, Bedford Village, N.Y.; Keith W. Robbins, MAAG Navy Box C-150, F.P.O. San Francisco, Calif.; Daniel P. Moynihan, 115 Frontenac Avenue, Buffalo 16, N.Y.; Thomas E. Phelan, c/o Mr. Eugene Phelan, 36 Aberdeen Avenue, Montreal 6, P.Q., Canada; George B. Allen, 863 Washington Street, Norwood, Mass.; Professor Lawrence R. Culver, University of Puerto Rico, Mayaguez, Puerto Rico; Charles T. McGrady, 2608 Arizona Avenue, El Paso, Texas; Dwight VandeVate, 303 Sandringham Road, Rochester 18, N.Y.; and Howard B. Upham, 400 Oak at Burnet, Cincinnati 19, Ohio.

Our sympathy goes to the families of the following: Walter J. Croft, Jr., Dedham, Mass.; Thomas N. Berlage, Washington 6, D.C.; Carrington M. Stanford, London, England; and Major Frederick W. Bonfils, Denver 6, Colo. — WHITWORTH FERGUSON, *Secretary*, 333 Ellicott Street, Buffalo 3, N.Y. C. GEORGE DANDROW, *Assistant Secretary*, Johns-Manville Corporation, 22 East 40th Street, New York 16, N.Y.

1923

The most important piece of news concerning the members of our Class is the appointment of our own Dr. Julius A. Stratton as the 11th president of M.I.T. The following letter was sent to Dr. Stratton by your Secretary: "Congratulations on your recent appointment as President of M.I.T. As secretary of your Class at the Institute I am sure that I can speak for the entire membership when I say that we are proud of the fact that a member of our Class has achieved this high honor in the educational field. Your illustrious career has brought honor not only to yourself and your family, but also to the Class of 1923. We wish you success in your new undertaking and there is no doubt in our minds that the right man has been chosen. Best personal regards."

By this time you should all have received a copy of the report of our 35th class reunion that was held last June at Cotuit on Cape Cod. If any member of the Class has not received a copy, please let your Secretary know. There are some extra copies if anyone wants them.

I have received the following memorandum from Shorty Chamberlin, which is self-explanatory: "I took off from Idlewild Airport for Europe late in June for a month's tour covering parts of England, Belgium (including the World's Fair), Switzerland, Italy down as far as Rome, and France. The principal cities visited were London, Brussels, Brugge, Cologne, Wiesbaden, Heidelberg, Milan, Venice, Florence, Rome, Rapallo, Pisa, Nice, Monte Carlo, and of course Paris. In the course of visiting museums and cathedrals and just browsing around, I must have walked one hundred miles, not to mention the number of steps climbed up and down cathedral towers, such as St. Peters in Rome and Notre Dame in Paris. The effort was well worth while and I accumulated a collection of stereo pictures that will provide a means of touring by armchair during the winter months when I cannot play golf. We did a 'double take' about two hours east of Gander on the trip over because of a bad engine, but otherwise the air flights were uneventful. Harking to the oft heard criticism directed toward engineers for not taking an active part in local government affairs, I was talked into running for the Township Committee, the local governing body. Now you know at least one of the few Republicans elected in the recent election."

Tex Beretta is again in the news as he has become chairman of the state board of registration for professional engineers in Texas. He holds charter membership No. one in the Texas Society of Professional Engineers and was instrumental in its organization. He has served as national director, vice-president, and president of the National Society of Professional Engineers. Tex has also recently been elected to the board of governors of Southwest Research Institute. As you know, Tex is head of his own firm of consulting engineers and is also president of the Bank of San Antonio.

Our Vice-president, Howard Russell, finds plenty of things to keep him busy. Currently he is president of the Rotary Club of White Plains and was recently elected a director of Westchester County Association, which is the chamber of commerce for the county.

Robert C. Sprague, Chairman of the board of the Sprague Electric Company, spoke at a conference luncheon on August 14 during the three-day Conference on Electronic Standards and Measurements held August 13 to 15 at the National Bureau of Standards' Boulder, Colo., Laboratories.

Ernesto Ledesma has two sons in the United States: one is working for the Im-

proved Risk Mutuals Insurance Co.; and the other, who was married last summer, is studying electronics at the Radio Corporation of America Institute in New York City. Howard Russell entertained them at his home for Thanksgiving.

Philip Coleman reported the following bit of news: "If you have not already had the news from other sources, you will be interested to know that Dave Davenport and his attractive lady were married in October at Washington, D.C. Of course they are taking up residence in Brazil, where Dave represents Stone and Webster. There is no Brazilian address as yet, but the return address on the wedding announcement was 5117 Sylvan Road, Richmond, Va."

The recent Directory issued by the Alumni Association of M.I.T. indicates the following class members who are active in that organization: Alumni term members of the Corporation, Horatio L. Bond and Hugh S. Ferguson; former presidents, Horatio L. Bond and Hugh S. Ferguson; member at large of the Council, Cecil H. Green; class representative on the Council, George A. Johnson; Council representatives of M.I.T. Clubs — Egon E. Kattwinkel, Tokyo, and David W. Skinner, Brussels; national nominating committee member, Bernard E. Proctor; Alumni representative on departmental Visiting Committees — Civil and Sanitary Engineering, Alfred E. Perlman; Medical, Egon E. Kattwinkel; Sponsored Research, William Webster; Officers of M.I.T. Clubs — Bogota, Colombia, President, Alberto Lodo-Guerrero; Brussels, Belgium, President, Paul Heymans; Miami, Fla., vice-president, Clarence P. Thayer; Monterrey, Mexico, President, Bernardo Elosuá; Oslo, Norway, President, Harold R. Bjerke; Panama, Canal Zone, President, Eduardo Icaza; Pittsfield, Mass., President, Harry Kalker; Educational Council of the Institute — California (Los Angeles area) Kenneth C. Kingsley; Connecticut (Danbury) Thomas E. Rounds, (New Britain) Archibald Williams, Jr., (New Haven) Albert S. Redway; Delaware, Robert L. Hershey; Florida (Miami area), Clarence P. Thayer; Illinois (Chicago area), Philip L. Coleman; Indiana, Lowell L. Holmes and Frank J. Travers; Minnesota (Duluth area), Charles R. Bailey; Nebraska, Richard D. Ferguson; New Jersey (Northern area), Channing P. Clapp and Roger J. Evans; New York (Westchester County area), John J. Murphy; Pennsylvania, (Lancaster area), Charles K. Miller; Texas (San Antonio area), Bartlett Cocke; foreign countries, Argentina, Jose Carlos Bertino; Belgium, Paul Heymans; England, John W. Voelcker; Mexico, Bernardo Elosuá; and Norway, Harold R. Bjerke.

Your Secretary appreciates the notes he has received from members of the Class — just keep them coming. — HERBERT L. HAYDEN, *Secretary,* E. I. du Pont de Nemours and Company, Leominster, Mass. ALBERT S. REDWAY, *Assistant Secretary,* 47 Deepwood Drive, Hamden 17, Conn.

1924

Not the biggest event of the season, but one of the most important for the Class and certainly one of the most enjoyable for those who were there, was the initial reunion committee meeting. It was in December at the home of Treasurer G. Raymond Lehrer. In attendance: President Littlefield; Vice-president Knight; Reunion Chairman Cardinal; Treasurer Lehrer; of course, your Secretary; and an equal number of charming wives. Plans were started at the cocktail hour, embellished during dinner at the Braeburn Country Club, and completed in the Lehrers' basement rendezvous. One appointment that was endorsed unanimously by the husbands and with only polite murmurs of dissent by the wives: the Ladies Committee consists of Mesdames Littlefield, Knight, Cardinal, Lehrer and Kane.

By the way, your Secretary refuses to accept the responsibility for any typographical errors that may creep into these notes. In spite of the announcement in our December column that we will be staying on "Cape Cord," it's still Cape Cod!

Big affair of the New York Club each year is its annual Silver Stein dinner. This year we had a good group in attendance, 13 in all. And on December 10 our monthly luncheon at the M.I.T. Club brought out Paul Cardinal, Austin Cooley, Vin Lysaght, Bill MacCallum who had dropped by to see your Secretary two days before, Mal MacNaught, Greg Shea, Howard Stevens, Nate Schooler, and Henry Tanck.

There was another big dinner in November, the annual award dinner of the Flight Safety Foundation, this one at the Claridge in Atlantic City. Four awards were made for "Distinguished service in achieving safer utilization of aircraft" to Mr. Link (Link Trainer), Mr. Hasbrook of Cornell, the U. S. Coast Guard, and Otto E. Kirchner'24. Otto is listed as operational consultant to Boeing, and here's why he rated the award: "His contributions to safety have been so broad that it is difficult to list them specifically. His relation to the development of the tear resistant fuselage is one; others are his work in 1940 to improve the exterior lighting of aircraft, the development of the escape slide, original concepts in the study of crash loads. His most important contributions of personal interest and leadership are intangible because they have permeated all phases of transport aviation." A very impressive citation.

Alvan Fisher was with us after graduating from the Naval Academy. He got both an S.B. and S.M. in Electrical Engineering, then went to work for Telechron. He's still there as manager of defense products. All this is background for the fact that Al has kept up his active interest in the Naval Reserve and in September was upped to the rank of rear admiral in the inactive reserves. The wife of another of our admirals made the news recently as she crashed a bottle of champagne against the bow of a ship named for her husband, Admiral Felix B. Stump, former Commander in Chief of the Pacific Fleet.

Another sea-going classmate, Chief Engineer Simonds, sent a card from the Canal Zone showing a group of "beautiful young ladies in colorful national costumes of Panama," then followed a day later with one from Aruba with the cryptic notation, "The next place we go will surprise even you." Antarctica? Thule? Up the Volga? Time will tell.

The Alumni Association Directory for the year has just been received, so let's see who's doing what. Top job goes to Ed Hanley, Alumni Term Member of the M.I.T. Corporation. Max Ilfeld and Sox Kinsey are members at large of the Alumni Council. Regular Council members, representing our Class and various clubs, are: Ray Lehrer, Russ Ambach, Ave Ashdown, George Knight, Herb Stewart, and your Secretary. Then there are four of us, named previously, on departmental Visiting Committees. Not as many club officers as usual, only five. Two presidents, Nish Cornish in Mexico City and George Fertig in Birmingham; a V.P., Walter Weeks in Louisville; a secretary-treasurer, Blay Atherton in Manchester; and a treasurer, Clint Conway in Baltimore. That does it. Not a single club officer in either Cleveland or Los Angeles this year, and that's a change. Educational Counselors are spread all over the world. There are about 700 of them now, of whom 15 are '24 men. We probably don't win any prize for numbers, but it's a sure bet we do for distance. It seems highly improbable that any counselor is farther removed from Cambridge than Justice Arthur Tyndall of Wellington, New Zealand.

So much for now. The Happy Holidays are behind us, winter won't last much longer; before you know it the birds and the apple blossoms will be back and then it's only a step into June. See you at the Oyster Harbors Club on Cape Cod [Note to Ed: no "R" please] — HENRY B. KANE, *Secretary,* Room 1-272, M.I.T., Cambridge 39, Mass.

1925

The unpleasant part of this report should be taken care of first. The Boston newspapers on Friday, November 28, 1958, noted the death of Frederick Winsor, Jr. He was well known in the Boston area as a writer and an architect. He was graduated from Harvard and received both a bachelor's degree and master's degree in Architecture at the Institute. In addition to his architectural practice, he was the author of much unpublished light verse and children's books, most recent of which was *The Space Child's Mother Goose,* a work of pseudoscientific whimsey, mention of which was made in this column within the past few months.

On the brighter side of the ledger, Ken Robie, Superintendent of the Water Department in the town of Brookline, Mass., takes on an additional assignment as of January 1, 1959, when he assumes the post of superintendent of streets. In addition to these assignments, Ken is active as vice-president of the New England Water Works Association. He is also a member of the American Water Works Association and the American Public Works Association.

Garvin A. Drew, Class Agent for 1925, has recently been elected manager of the A. Schrader's Son Company, the nation's largest producer of pneumatic valves. Chink, as he is known to most of us, has

been with Schrader's company since leaving M.I.T. You should be reminded, in his behalf, that if you have not already made your contribution to the Alumni Fund this year, make it a point to send your check in immediately.

From the several address changes during the past month it is noted that Nelson (Tod) DeFoe is now in Mallorca, Spain.

Charles M. Cooper, who is with the Du Pont organization, was in Cambridge recently; and although he did not have an opportunity to visit with your Secretary, he did call on the telephone.

Another '25 man who is in the Cambridge area is Morrough P. O'Brien. Mique, who is dean of the College of Engineering at the University of California at Berkeley, Calif., is on a sabbatical leave and is spending his time between Harvard and M.I.T. Several of the Class hope to get together with him during his stay in this area. — F. L. FOSTER, *Secretary*, Room 5-105, M.I.T., Cambridge, Mass.

1926

A recent newspaper clipping told of the elevation of John Drum to president of the Glascock Manufacturing Co. of Muncie, Ind. John has been with Glascock since 1946 and has been executive vice-president since 1950. We wrote Johnny for more details and received a letter in mid-November, from which we quote: "The monkey is really now on my back to maintain the record which has been established over the past several years by our company. This tempo has been badly reduced by the '58 experience; but we have been able to hold our own in the profit picture percentage-wise. Most of our pre-mix equipment is located in industrial spots; hence the sales have been materially off. We have just launched a new device which vends milk and milkshakes into cups from bulk containers — five- or ten-gallon milk cans. It has a great potential, at least according to our now Vice-president-Sales, one E. Bird Kelly of the notorious Class of '26. It is up to him to put it over. If one of the Kelly twins can successfully promote the sale of *soft* drink equipment, I am sure that dairy products will be simple for him. At least we hope so; and he better had, too. Chet Buckley phoned me from Chicago the other day. He was there at a meeting with his principals but is now living in Warren, Ohio, and heading up the Standard Transformer Co. there. I understand that Jim Drain has recently been in Europe, but do not know any details of his trip or the excuse for same, if any. My son, Hugh, 16, is at Proctor Academy, Andover, N.H., again this year and my daughter, Gwen, 14, is in her first year at Miss Hall's in Pittsfield, Mass. So Isabel and I are sort of rattling around at home. However, we do plan to come east for the Thanksgiving holiday, headquartering at Beverly Farms with my sister, Mrs. E. Carle Shotwell. If you are going to be at Pigeon Cove, let me know before a week from Monday. I have always wanted to see that spot. Best regards, Johnny."

Johnny did get to Pigeon Cove on Sunday morning after Thanksgiving, and we had a grand old reunion. We had not expected to be at Pigeon Cove at all that week end because we had already accepted an invitation to the wedding of Charlie Rich's daughter, Nancy, at St. Albans, Vt. However, Ruth's mother became ill and we were unable to leave — so we missed the wedding and missed seeing Charlie. But we are planning to stop off at St. Albans sometime during the coming spring.

We had a letter the other day from Bill Latham, who is now resident engineer for the Niagara Project of the power authority for the state of New York. Bill sent us a clipping from the *New York Times* which included a fine picture of our distinguished Class President. The *Times* had Dave tagged as a member of the Class of '27, but after making that one correction we will quote from the clipping: "The board of trustees of the New York Public Library yesterday elected as a member David A. Shepard, a director of the Standard Oil Company (New Jersey). Gilbert W. Chapman, president of the library, said after a meeting of the board at the Fifth Avenue building that Mr. Shepard succeeded to the membership formerly held by the late Charles Pratt. The new trustee began his association with the library in 1951, when he joined its citizens advisory committee. He is now serving as chairman of the petroleum group for the 1958-59 fund appeal, whose goal is $500,000. Mr. Shepard, a resident of Purchase, N.Y., is an Alumnus of the Massachusetts Institute of Technology, from which he was graduated in 1926."

A clipping from the *Hartford Times* tells of the death of classmate Charles T. Shea at Willimantic, Conn. We quote from this clipping: "Charles T. Shea, 57, former resident here, died Tuesday at a hospital in Mount Holly, N.J. A brother of the late Probate Judge C. Vincent Shea, he was a graduate of the Massachusetts Institute of Technology and was employed as an engineer in a civilian capacity by the federal government." A clipping from the *Electronic News* tells of Al Pote's latest venture. Why don't we just go to the clipping as a means of giving you this story: "A small, three-year-old electronics firm crossed into the black during fiscal 1958 after successfully bumping heads with the giants of the telecommunications field. This is Hycon Eastern, Inc., formed in 1955, and oddly, better known abroad than at home for its engineering of communication systems. An interview with Alfred J. Pote, Executive Vice-president and Director of Engineering, revealed the firm posted a profit of some $72,000 on sales of $3.6 million in the year ended January 31. This compared with a loss of $297,000 on $3 million sales in the prior year, mainly attributed by Mr. Pote to "heavy investment in research and development programs."

I guess you have probably guessed it by now — this issue of class notes is not being written at Pigeon Cove. We were there for the week end but I left my envelope of clippings and my Dictet tape recorder in Winchester, so I waited until returning home on Sunday night to put the notes together. It was really beautiful at Pigeon Cove today even though it was extremely cold and the kids were skating on our quarry pit. There must have been a really heavy storm at sea this week, for the waves were coming in in big, powerful, but slow rollers. They didn't make much surf on the shore; but about a mile and a half off shore there is a large clump of rocks called the Salvages, and they were white with breaking waves all day long. It is hard to believe that this is the same area in which we race our Star boats in the gentle (and sometimes not so gentle) breezes of July and August. I have just had word that there is a Sunday night snack awaiting me before the living room fireplace — so I fear I will have to say so long but will see you in March. — GEORGE W. SMITH, *Secretary*, c/o E. I. du Pont de Nemours and Company, Inc., 140 Federal Street, Boston, Mass.

1928

Bill Kirk stopped in at the Institute a few days ago and visited with Bill Carlisle. Bill Kirk's son George, an M.I.T. junior and member of Beta Delta Chi fraternity, is an outstanding player on the varsity hockey team. George is also one of the best sailors of the M.I.T. Nautical Association and has engaged in a number of national meets. Bill has three other sons and two daughters. Bill, Jr., is a sophomore at Holy Cross College; David is in his last year of high school; and Joseph is in grade school. Bill's daughter Ann is in the ninth grade, and Mary is a junior in high school. Bill himself has made the investment business his career and is executive vice-president with John P. Chase, Inc.

Willis Tibbetts, who is something of a shutterbug, took a number of excellent color slide shots at the 30th reunion in June. He showed these to a group of his friends at his home in Reading, Mass., the week before Christmas. On hand to enjoy the review were Jim and Frances Donovan, Bill Carlisle, and Walt Smith. It was a wonderful evening. The Tibbettses, Will and Anna, had made a tour of Europe in the summer of 1957 and brought back hundreds of beautiful color slide photographs of places they visited. Some of these also were shown during the evening to a highly appreciative audience. The Tibbettses' children are Jacqueline, 17, and Gordon, 19. Jackie wants to study to be a nurse and Gordon, who attends Gordon College, plans to follow the ministry. — GEORGE I. CHATFIELD, *Secretary*, 100 East 42d Street, New York 17, N.Y. WALTER J. SMITH, *Assistant Secretary*, 15 Acorn Park, Cambridge, Mass.

1929

The big news this month is the excellent response which we received to the first mailing for the 30th reunion. As of the date of going to press in mid-December, the following plan to be in attendance at Bald Peak Colony Club in June: Martha and Earl Abbe, Maxine and Bill Aldrich, Evelyn and Brig Allen, Doris and Bill Baumrucker, Kay and Eric Bianchi, the Fred Cellers, Ollie and Tacks Crosby, the George Cudheas, Fran and Paul Donahue, Barbara and Al Eigenbrot, Althea and John Ellsworth, Marie and Jim Fahey, Clara and Ed Farmer, Helen and Bion

Francis, Joan and Wally Gale, Paul Gill, the E. R. Godfreys, Doris and Joe Green, Dorothy and Sears Hallett, Helen and Hugh Hamilton, Kitty and Bill Harris, the Carl Harrises, Peg and Fish Hills, Ellie and Sol Horwitz, the Mac Hubbards, Tom McCue, Betty and Dan McDaniel, Elaine and George McKenna, Marge and Jim Magenis, Florence and Ted Malmstrom, the Dev Martins, Mary and Frank Mead, Barbara and George Meyers, Ed Murphy, Molly and Jack Osborn, Mary Lou and Dave Peene, Martha and Len Peskin, Dot and Carl Peterson, Florence and Frank Pierson, Olive and John Rich, Elinor and Bill Saunders, Dorothy and Wade Shorter, Helen and Tom Speller, Rhoda and Rodolphus Swan, Elise and Warren Walker, the Clarke Wallings, Lee and Curt Whiting, Olive and Gordon Williams, D. A. and John Wilson, Marge and Bill Young.

The "Hopefuls," many in number and most of whom we hope will turn up as "Plan To's," are: Martha and Ira Abbott, Jeanette and Sid Albert, Nicholas Alexander, Elisabeth and Glenn Andrews, Betty and Charles Bacon, Marguerite and Win Bearce, Ruth and Arthur Bearse, Herf Blake, Sally and Gordon Bowie, the Murry Brimbergs, Betty and Newt Bryant, the Gordon Carrs, Bertha and Philip Chambers, Tom Coe, Nina and Dick Coveney, Eleanor and Jim Cutler, Dorothy and Marshall David, Lucile and Charley Denny, Helen and Karnig Dinjian, Frank Donnelly, Lee and Harold Ford, Marion and John Foster, Peg and Don Funk, Agatha and Henry Giles, Eugene Gilman, Romeo Guest, Bertha and Albert Harris, Evelyn and Bill Jones, Mary and Paul Kingsley, Hazel and Alexis Kononoff, Luella and Mark Libbey, Dorothy and Joaquin Llansó, Maxine and Milton Male, Bea and Frederick McLane, Dorothy and H. P. Meissner, Bessie and Connie Monsul, K. and Rich Opper, Peryl and Bob Orrill, the Harold Peases, Dorothy and Ross Pfalzgraff, Fran and Ollie Pierson, Dot and Ed Powley, Henry Robbins, Dorothy and Ed Roche, Sam Shaffer, Elmer Skonberg, Sara and Mace Smith, Eva and Morris Smith, Alice and Adam Stricker, Van and Harold Tallman, the Pierre Vinets, Olive and George White, Val and Bill Whiting, Elsie and Walt Winchell, Thelma and Archie Wolbarsht, Edward Yates.

I have been so darn busy that I have not had an opportunity to reply to the many personal notes on the return cards. I hope to get to this one day soon.

Your committee has not met since just before the first mailing, so you are as up to date as we on the plans; but, as we tried to emphasize in the notes and first mailing, there is to be no regimentation: do as you please when you please.

A letter from Dr. Kiichi Murakami came to your Secretary from the Review Office. Kiichi is head professor of the Industrial Engineering Department of the School of Science and Technology, Nihon University in Tokyo. He reports he completed in November a six weeks' tour in the United States sponsored by the International Co-operation Administration, and the Japan Productivity Center with the Applied Industrial Management Specialist Study team. Dr. Murakami spent Thanksgiving in and around Boston and enjoyed a real American Thanksgiving dinner with the Palmers of Marblehead. Kiichi studied metallurgy at Tech and attended the first World Metallurgical Congress in Detroit in 1951.

One sad note in recent news is that Sam Gordon passed away in Columbus, Ohio, on October 26. Sam was a consulting engineer with Battelle Memorial Institute in Columbus, where he was active in the Institute of the Aeronautical Sciences and the American Society of Mechanical Engineers.

If you did not send in the return card or if you lost it, write me directly, if your plans will permit attending the 30th. Our second mailing on the reunion will be in your hands shortly. — FISHER HILLS, *Assistant Secretary*, 62 Whittemore Avenue, Cambridge 40, Mass.

1933

Two of our brethren share the honors this month: Stanley H. Walters, VIII, is now vice-president in charge of sales for the Calidyne Company of Winchester, manufacturers of electronic and electromechanical vibration test equipment. Stan, who has moved up from the post of assistant to the president, has authored numerous papers in the fields of electrolytic condensers and spectrochemical instrumentation. Yes, Calidyne plays a significant role in the missile business. Our other man of the month is Joseph L. Bird, XIII-A. With the caption "Detroit Success Story," the *Detroit News* tells how Joe is exploiting high explosives in the shaping of metals; this could mean much in time and money to the automotive and other industries. But in Joe's business, you simply can't make the same mistake *once!*

Horace MacKechnie reports in cheering tones from his new home in Williamsville, N.Y.; Mac is with the Buffalo division of Sylvania. If Mac and his family have accumulated as much family gear over the years as most of us, moving and getting settled can consume all free time for months on end.

Congratulations to Anthony G. Blake, X-A, who is now an associate professor at Rose Polytechnic Institute in Terre Haute, Ind. One change of address to report: Ferdinand M. Johnson, II, from Spartanburg, S.C., to Greensboro, N.C. Ferd is now with the Cone Mills Corporation, and we know the Class would welcome further word on Ferd's new assignment.

Even a quick perusal of the current Directory of the Alumni Association shows that '33 men are really doing their stint in many ways for the Institute. Here is a partial list, and to each we say "Thanks" in behalf of the Institute and the Class. Lincoln W. Ryder is class representative on the Alumni Council. Alumni Council representatives of M.I.T. Clubs are William E. Barbour, Jr., for Duluth; Louis H. Flanders, Jr., for New Bedford; and Clarence R. Westaway for Salt Lake City. Leburton D. Webster is one of the associates of the Council. Westy Westaway is also chairman of the class reunions committee. Alumni representatives on departmental Visiting Committees are Donald G. Fink for Electrical Engineering, Robert Heggie for Food Technology, Dayton Clewell and Athelstan Spilhaus for Earth Sciences, and Pete du Pont for Student Activity. Chaim Swirsky is vice-president of the M.I.T. Club of Israel in Haifa; Joel B. Stevens, Jr., vice-president, and Robert Forbes, secretary-treasurer of the M.I.T. Club of East Tennessee in Knoxville; Stewart J. Hungerford, vice-president of the M.I.T. Club of Quebec in Montreal; Vernon O. Bowles, secretary of the M.I.T. Club of New York; Ingvald E. Madsen, president of the M.I.T. Club of Western Pennsylvania in Pittsburgh; Robert B. Mills, vice-president of the M.I.T. Club of Virginia in Richmond; Robert E. Smith, president of the M.I.T. Club of Rochester, N.Y.; William V. Reed, vice-president of the M.I.T. Club of Puerto Rico in San Juan. Nice going '33! — R. M. KIMBALL, *Secretary*, Room 3-234, M.I.T., Cambridge 39, Mass.

1934

At this writing in early December our news all deals with plans for our 25th reunion next June. You will have read about some of the details in the reunion committee's January mailing. This all got under way on November 20 when reunion chairman Mal Stevens held a meeting of his committee. Those attending were Hank Backenstoss, Bob Becker, Joe Bicknell, Roger Coffey, Al D'Arcey, Les Doten, Ernie Massa, Ed Nowell, Sam Prince, Larry Stein, and Charlie Wright. From the enthusiasm shown and the ideas advanced, the Class can be sure that the week end beginning June 12 will be something not to be missed. We are fortunate to have such an able group to do the arranging.

If you are one of those who have not yet sent in his biographical material for inclusion in the class book being prepared by Charlie Wright, procrastinate no longer and send yours in. A card addressed to reunion headquarters, Building 17, M.I.T., will bring another questionnaire if yours has been swept away with the old newspapers. As of mid-December, only 160 or so returns have been received. Your story is wanted by your classmates.

Also, in anticipation of next June, Hank Backenstoss called together on December 9 those in the Boston area who have been active in the Compton Scholarship fund effort in which the Class has been engaged for more than three years. Those attending were Irving Geltman, Arthur Miller, Tom Murphy, Aaron Redcay, Les Doten, Hal Reynolds, Dave Mooney, Lou Frank, Carl Wilson, Sam Groves, Al D'Arcey, Walt McKay, Sam Blake, Chuck Kearney, Roger Williams, and, of course, Hank Backenstoss. Don Severance'38 of the Alumni Office was present to outline the background and operations of the Alumni Fund. The purpose of the meeting was to plan the remaining portion of the fund drive. Of course, the hope is that the Class will do all possible to make its 25 year gift as significant as possible. There should be no lack of assurance on this score, since several deserving students are even this year receiving scholarship aid as a result of the class giving. It appears

evident that the total amount which will be raised will set a new high for M.I.T. classes and so will serve as a target for classes which follow.

Next month Mal Stevens will write these notes and no doubt will tell you more about these matters. — WALTER MCKAY. *Secretaries:* WALTER MCKAY, Room 33-217, M.I.T.; MALCOLM S. STEVENS, Room 1-139, M.I.T., Cambridge 39, Mass.; JOHN A. HRONES, Vice-president for Academic Affairs, Case Institute of Technology, University Circle, Cleveland 6, Ohio.

1936

Well, it finally happened — last month we were not represented in the notes. The reason? Lack of material. Some news did come in later, but the deadline had passed and it was too late. Please try to send something in on any old match cover or whatever you have at hand.

An interesting note was received recently from the Institute. I still cannot figure out why the proud fathers did not let us know first. "In the Class of 1962 at M.I.T. are: Frederick Adolph Prahl, 3d, West Bare Hill Road, Harvard, Mass.; and Laurence Reid Proulx, 31 Wells Road, West Hartford 7, Conn."

Received a nice note from Al Bagnulo. As reported in the December notes, the Colonel is now at Fort Belvoir, Va. Al is assistant director of the U.S. Army Engineer Research and Development Laboratories. He did considerable traveling on his last assignment; let's hope this one allows more time home with Helen.

Irving Kelsey dropped out of school when his father died in 1935 and did not graduate with the Class. We now have some news on him, filling the gap. On the death of his father he left school to take care of the family business, old Kelsey's Market in Pittsfield, Mass. Bud served with the Air Force, mostly in England, from July, 1942, until December, 1945. He graduated from the University of Massachusetts with the class of 1949. In 1954 he taught mathematics and algebra at South Junior High. Bud recently was appointed manager of Friendly Ice Cream's new Pittsfield "town house" restaurant. Bud's home address is 22 Gordon Street, Pittsfield, Mass.

Homer Webster has been promoted from commander to captain. His address: 137 Lake Avenue West, Kirkland, Wash. Stan Whittemore's new address is 80 Linden Street, Everett 49, Mass. Ernie Linke has moved over to Westwood from Teterboro. The new address is R.D. #2, Westwood, N.J.

Ceremonies marking the retirement of Major General William M. Creasy, Chief of the Army Chemical Corps, were held at the Army Chemical Center in Edgewood, Md. Bill headed the Chemical Corps from 1954. Previously he was post commander of the center for three years. In World War II he was chief of the ground planning section of the Allied Southeastern Asia Command, wtih headquarters in Ceylon. He was graduated from West Point in 1926 and got his master's with us in '36.

Received a two-page spread from the *Greater Philadelphia* magazine. The top half of both pages pictures the board of directors of SKF Industries. The caption reads: "Gentlemen of the Board." One of the gang is Bob Worden. The following comments follow his name: ". . . is also on the boards of A. Bentley and Sons and Mather Spring, both of Toledo, Ohio, and a partner in Worden and Risberg. Born in Cambridge, Mass., he is a graduate of M.I.T. and active in that school's Alumni Fund and the development funds of Cornell and Bryn Mawr's Shipley School. He lives in Wynnewood."

Broc McMillan participated in the fall meeting of the New England section, American Society for Engineering Education, at Harvard University. He is with Bell Telephone Laboratories and was a member of a panel on "Mathematics for the Future." Also, Boynton Beckwith participated in the national conference on Practical Problems of Modern Meteorology in Denver, Colo., sponsored by the American Meteorological Society. Boynton was coauthor of a paper on "Hailstorm Features Determined from Studies in Alberta and Colorado."

Tony Hittl sent in some clippings from a Buffalo paper on George Trimble. Tony spotted them while on vacation and then misplaced them. George is vice-president of the Martin Company. George's firm is responsible for a big part in the Dyna-Soar, manned space-flight project. He described the technical problems involved as "among the most challenging ever faced by the aircraft industry."

Three West Coast changes: Bill Royce is now at 26344 Dunwood Road, Rolling Hills Estates, Calif.; Brent Lowe's new address is P.O. Box 257, La Jolla, Calif.; Bill Kennedy's new address is 1315 Inverness Drive, Pasadena 3, Calif. — JIM LEARY, *Secretary,* One Putnam Park, Greenwich, Conn.

1937

Joseph Sousa has joined the Electric Specialty Co., Stamford, Conn., as chief electrical engineer. Prior to this Joe was chief electrical engineer of Star-Kimble Industrial Motor Division of Safety Industries, Inc., New Haven. He obtained his master's degree in Electrical Engineering from Stevens Institute of Technology and is a member of the American Institute of Electrical Engineers. George Rosen is chief of analysis of the Hamilton Standard Division, United Aircraft Corp., and spoke recently at the mechanical engineering seminar in Higgins Laboratories, Worcester Polytechnic Institute. Dr. William P. McHugh has just been appointed superintendent of the Middleton Sanatorium in Massachusetts. Leo Moore, Associate Professor at M.I.T., was awarded a fellowship for outstanding service to standardization at the recent meeting of the Standards Engineers Society which was held in Philadelphia, Pennsylvania.

Jonathan B. Cobb is a chemist, Technical Service and Development, Lacquers Department, Pittsburgh Plate Glass Co., Paint Division, Milwaukee, Wis. (Home of the Braves). He will have been on this job for 15 years in March, 1959. He attends the meetings of the Milwaukee M.I.T. Club quite regularly. Jonathan and his wife Eleanor live at 4533 North Larkin Street, Milwaukee, Wis. Ed Bartholomew's latest publication is "Grain, Growth, and Recrystallization Studies on Commercial Titanium, IPC-55 and Alloy, Ti-100A," Transcript of the American Society for Metals, Volume 50, 1958. Ed is past president of the Hartford Engineers Club and past chairman of the Hartford chapter, American Society for Metals. Ed and his wife Sara have four children. H. B. VanDorn, his wife Eleanor, and their three children have recently moved to 51 Chatham Road, Kensington, Conn.

Jim Newman was born on November 21, 1914, in Winchester, Mass. He prepared for M.I.T. at Phillips Exeter Academy. He received his bachelor's degree at M.I.T. and attended Chicago University, School of Business and received his Master's in Business Administration (Beta Gamma Sigma) in 1952. Upon graduation, Jim joined the American Rolling Mill Co., Middletown, Ohio as a research assistant; and in June, 1938, he transferred to Ingersoll Steel Division, Borg-Warner, Chicago, Ill., as an assistant to the president. Jim served three and one-half years in the Air Force and left the service as a major. In 1946 he joined Booz, Allen, and Hamilton, management consultants, and became a partner in 1951. Jim is married to JoAnn Williamson Newman and they have four daughters: Katherine, 15; Judith, 12; Phyllis, 11; and Patience, 9. Jim is a director and vice-president of the Research Foundation, Chicago, Ill., and a member of the M.I.T. Club of New York; New England Council; University Club, New York; and the Pine Orchard Club of Pine Orchard, Conn. His address is Beach Street, Short Beach, Conn.

Phil Peters reports that this summer he and Ruth attended the executive session of Aspen Institute, Aspen, Colo., for two weeks while their three boys stayed on a nearby ranch getting their fill of horseback riding. Following this, they took a tour of the principal national parks before heading east. On their way back east, they stopped off in Cleveland and visited with Dick Young and his family. Dick and his partner have sold their company, General Carbonic Corporation, and Dick is now in the process of moving to Sao Paulo, Brazil. Down under, Dick is aiming to be general manager of a foundry operation which will be one of the most extensive in Brazil, employing several thousand workers. The project is to be financed partially by United States money and partially by Brazilian interests. It sounds like an exciting adventure and certainly should succeed under Dick's capable management. Until he gets settled Dick's temporary address is Hotel Jaragua, Sao Paulo, Brazil. Phil also reports running into Curt Powell and Ralph Webster at M.I.T. Alumni Council. Curt continues as a marine engineering professor and Ralph Webster seems highly successful and happy in his work as senior executive in an iron construction firm.

Probably one of the most exciting yet incomplete rumors about '37 Alumni is the now not so recent marriage of perennial bachelor George Wemple to a gal with the exotic name of Zaza. George is demonstrating that he is a family man

after all because there are announcement cards floating around the countryside indicating that he is a proud father of a recently born son named Peter Holland Wemple. It only took George about 20 years to catch up on some of the rest of us, but there are bets going on that he'll henceforth make up for lost time. While Alumni Day in June, 1959, is not on a quinquennial reunion year for our Class, it bids to be an exciting occasion with the advent of our new President Jay Stratton'23. A sizable contingent of '37 members and their wives already are planning to come back. It's not too early to lay your plans now to attend. You'll have a lot of fun and a chance to share notes with your '37 classmates. — ROBERT H. THORSON, *Secretary,* 506 Riverside Avenue, Medford, Mass. S. CURTIS POWELL, *Assistant Secretary,* Room 5-323, M.I.T., Cambridge, Mass. JEROME E. SALNY, *Assistant Secretary,* Egbert Hill, Morristown, N.J.

1938

From the routine change-of-address notices occasionally comes news that might be of interest to more than the class secretary. This source of information reveals that Julius Kovitz now has an address in Antwerp, Belgium. If Julius reads this, perhaps he could supply some news. In like manner we also learn that Harry Finn died in February, 1954. Can anyone add to this brief item?

Beaumert Whitton'33 writes that Curtiss Torrance participated in college night at Central High School, Charlotte, N.C., recently. Curtiss, he reports, has been in Charlotte since 1952 as an associate of the firm of Charles T. Main. Curtiss is active in church work and in various engineering groups. The Torrances have one child, a daughter 11. Curtiss would welcome a call from any of the Class visiting the area.

The Radio Corporation of America has established an organization to conceive and develop weapons for the space age. Nathaniel Korman has been appointed to direct this operation. He has been with R.C.A. since 1938. Homer Oldfield, who has been general manager of General Electric's Computer Department, Phoenix, Ariz., has been appointed to manage a new company component, the name of which is yet to be disclosed.

Albert Kaufmann of Nuclear Metals, Inc., was recently featured in an article in the *Lowell Sun.* The article was prompted by the fact that Nuclear Metals has new headquarters in Concord. — DAVID E. ACKER, *Secretary,* 49 North Hancock Street, Lexington 73, Mass.

1939

At Cedar Rapids I met Manning and Connie Morrill. Manning, busy as ever, had arranged to do some business for Cryovac; had brought Connie, mother of four and leader in community activities such as United Fund and little theater; and in his spare time had arranged for me to be transported 35 miles away on a certain Saturday afternoon where I had a choice seat on the 42-yard line at the Iowa-Ohio State game. To say that Manning operates is an understatement.

In Chicago I saw Dave Frankel, who manages a division of Machlett Laboratories, which manufacture and sell large vacuum tubes. Dave still travels a lot, but his duties are changing a bit these days; one youngster requires some of this, and there is another on the way. Dave hopes to report on all this personally at the reunion. Bill Mohlman is with Standard Oil in Chicago and in the last 20 years has had a number of interesting and challenging assignments investigating processes for making petrochemicals. We had lots to talk about.

George Morrison is now purchasing agent for Turner Construction in Chicago and in the last 20 years has built a number of buildings. Now he isn't building them any more, but he has the key to one in which there is fun and a welcome. Call on George in Chicago and see. Paul Stanton and his wife have moved from New England to Chicago, where Paul is a member of Mahogany Row for Clearing Machine Company, 6499 West 65th Street. The Stantons will be at reunion in June. Paul reported for Bob Stone, who is flying for United Air Lines and who couldn't attend our little get-together.

Morrie Nicholson and I had a short visit via phone. Morrie is professor in charge of the Department of Metallurgy at the University of Minnesota at Minneapolis now.

In the St. Louis area I spent a pleasant evening with Ryder and Betty Pratt. Four years ago Ryder started his own business as a manufacturer's agent to handle investment castings, shell mold castings, die castings, stampings, and certain kinds of machined parts. Business is good, says Ryder, and he now has two salesmen helping along. Those interested in discussing old times at Theta Chi or new business in the Midwest should write Ryder at 515 South Crescent, Kirkwood, Mo.

Also in St. Louis I saw Betty and John Noyes'38. I have always stopped to see John in St. Louis, but this time he helped me quite a bit with a little hole in my head which was giving me no little trouble. So, for help in this department, and for a friendly handshake as you travel, see John in St. Louis, who will take time off from engineering Quail (missiles, that is) and introduce you to his favorite dentist.

And this brings us now (December 14) to the end of this report and to a look forward to the holidays and the reunion in June. Holiday greetings will be a good preliminary to the personal renewal of old friendships. And I suppose we'll be hearing soon from Doc Wingard and his committees about details. Incidentally, by now we all know it takes some time and energy to get all these details worked out. Most of us will have a little spare time in the next four or five months, and I'm sure Doc would appreciate hearing from any of you who would volunteer say 10 or 15 hours of your time to help along with mailings, rooming arrangements, and the hiring of the dancing girls. — HAL SEYKOTA, *Assistant Secretary,* 416 Calle Mayor, Redondo Beach, Calif.

1940

Erling Helland has opened up a consulting service in the fields of city and regional planning and land economics in Tulsa, Okla. At present, he is an associate member of the American Institute of Planners and is a past president of the Ohio Valley and Great Plains chapters of the Institute. Erling also has served as a member of the Visiting Committee of the Department of City and Regional Planning at Tech.

George Phannemiller, who is the assistant superintendent of the Coast Guard Academy, gave a talk at Connecticut College on "Mission of the Coast Guard Academy." George pointed out that guarding sea coasts is but one of the many activities of the Coast Guard and that much of its work is to promote safety at sea and to prevent loss of life before an emergency occurs.

John Hollomon is one of the new directors of the Metallurgical Society of the American Institute of Mining, Metallurgical, and Petroleum Engineers.

Fred Port has been appointed general manager of the Automotive Division of the Electric Storage Battery Co. Previously he was manager of manufacturing and engineering.

The rise in postal rates has apparently reduced the amount of writing almost to the vanishing point. If you can't afford the four-cent stamp for a letter, a three-cent post card will do. Let's hear from you. — ALVIN GUTTAG, *Secretary,* Cushman, Darby and Cushman, American Security Building, Washington 5, D.C. SAMUEL A. GOLDBLITH, *Assistant Secretary,* Room 6-325, M.I.T., Cambridge 39, Mass. MARSHALL D. MCCUEN, *Assistant Secretary,* 4414 Broadway, Indianapolis 5, Ind.

1941

New positions make up almost the entire column this month; we enjoy passing along the good news. Congratulations to all of you, and may your successes continue!

Rogers Finch writes: "On October 20 I shifted from my old position as assistant director of the Research Division here at Rensselaer Polytechnic Institute to a new position, which has the usual complicated educational title of associate dean of the School of Science. This is turning out to be a most challenging position, especially at a time when technological education is undergoing many significant changes. The Finch family continues to thrive on its country place in the little village of Poestenkill."

Dr. Kenneth McKay is now director of development of components and solid state devices at the Bell Telephone Laboratories. He has been with Bell since 1946, when he began fundamental research studies on the physics of solids, including the interaction of energetic electrons with solids, and studies of secondary electron emission and electron bombardment conductivity in insulators and semiconductors. Later his work related to the electrical and optical characteristics of electrical breakdown in germanium and silicon. In 1952, he was named head of a group concerned with physical electronics research; and in 1954, he was placed in charge of the solid state research group. He holds nine patents. The McKays have two children.

John Meier has been appointed development engineer at the Hamilton Standard Division of United Aircraft Corporation in Hartford. He will be responsible for all project and development activities connected with the engineering of engine starters and the new auxiliary power package. John joined Hamilton Standard in 1946 as a senior metallurgist, after serving as technical assistant to the president of Midwest Forge Company. He became project engineer in 1949, senior project engineer in 1954, and chief materials engineer in 1956.

Dr. Frank Pittman has been named director of the Division of Reactor Development of the Atomic Energy Commission. This division has the responsibility for developing over-all A.E.C. policy for encouraging and assisting private activities in the civilian applications of atomic energy, as well as for directing the A.E.C.'s programs for development of nuclear reactors and associated equipment, processes, materials, and facilities. Dr. Pittman has been director of the Office of Industrial Development of the A.E.C. since it was established in December, 1957, and had also been acting director of the Division of Reactor Development since last August. He has been associated with the atomic energy program since 1944, when he joined the staff of the Los Alamos Scientific Laboratory. He was in charge of plutonium production there through 1948. He then joined the A.E.C., where he has been associated with the development of new production reactors and with operation of reactors at Hanford, Washington, and Savannah River, S.C.

Bill Hooper has been elected a vice-president of Republic Foil and Metal Mills; he joined the firm in January, 1956, and has specialized in the development of new and improved types of high-purity and standard aluminum foil for the electrical and electronics industries. He was previously with Sperry Products, Inc., of Danbury, Conn., from 1946 through 1955; in the last five years as assistant general manager of the Sperry Rail Service Division. Bill married Evelyn Day of Portland, Maine, in 1942. They now have five children and live in Brookfield Center, Conn.

John Pecevich has been promoted to the permanent rank of lieutenant colonel in the Air Force Reserve. He is a project engineer with Dewey and Almy Chemical Co. in Cambridge. He is married to the former Stacy Olenowich; they have three children and live in Beverly, Mass.

Dr. Davis Dewey, President of Baird-Atomic, Inc., estimates that sales and earnings of his firm will be higher this year than in any previous year.

Copies of the class directory are still available; if you would like one, please let me know. — IVOR W. COLLINS, *Secretary*, 9 Sunnyside Drive, Dalton, Mass. HENRY AVERY, *Assistant Secretary*, Pittsburgh Coke and Chemical Company, Grant Building, Pittsburgh 19, Pa.

1942

Alan Katzenstein writes that the Class of 1942 men in the metropolitan New York area meet for lunch every month at the M.I.T. Club of New York. The Club quarters are in the Biltmore Hotel at Madison Avenue and 43d Street. Dates are Tuesday, February 24; Tuesday, March 24; Tuesday, April 28; and Tuesday, May 26 (the formula is the Tuesday after the 4th Monday of the month). Alan continues: "All '42 classmates are invited to lunch with us along with the Class of '43. We usually start around 12:15 to 12:30, order from the club menu, and leave whenever business commitments or conscience dictate. Club members have been pretty well notified of luncheons. We want to reach nonmembers, both in this area and visitors in town." Among the recent luncheoners were Jim Stern, Lee Sharpe, Harvey Kram, and Bill VanNostrand.

Professionally, Alan is now with the advertising agency Lennen and Newell, Inc. Socially, Alan and Rhoda are now home owers and owners. "We moved at the end of September and are now full-fledged do-it-yourselfers."

Eric M. Wormser was recently elected vice-president in charge of engineering and sales of the Barnes Engineering Company. Eric has been with Barnes since its inception in 1952 as chief engineer of the Infrared Division. Prior to 1942 he held engineering positions in the field of optical-electronic instrumentation. He is a member of the Instrument Society of America, the Optical Society of America, and the executive committee of the Department of Defense Infrared Information Symposia. Eric is a past president of the Southwestern Connecticut section of the Optical Society. He, his wife, and two sons are residents of Stamford, Conn.

James S. Burns, Jr., has been promoted to specialist in the atomic drafting section of the Central Technical Department, Bethlehem Steel Company in Quincy, Mass. Except for his Navy service in World War II, he has been an employee of the Fore River Shipyard for the past 18 years. Bob Rines was one of the speakers at the recent Northeast Electronics Research and Engineering meeting held in Boston. At the session on inventions and patents, Bob presented a paper entitled "From the Legal Point of View." (Other speakers covered the inventor's and the commercial point of view.)

The American Ordnance Association has announced that its newly elected president of the Yankee Post is George J. Schwartz, Vice-president and general manager of the Boston division, Minneapolis-Honeywell Regulator Co. The Boston based Yankee Post takes in members from almost all of New England. Dr. John P. Davison has left Hanover, N.H., to teach at the Medical School of the University of Virginia in Charlottesville. Ernest H. Blaustein is now professor in the Biology Department of Boston University. Leon M. Flanders is now with Vitro Laboratories in Silver Spring, Md.

The long distance move of the month was made by Jack R. Williams. After many years in Europe, Jack has left Spain to return to New York City. Willard S. Bundy has moved from Ohio to North Massapequa, N.Y. Albert F. Clear, Jr., is now living in New Canaan, Conn. Ferdinand Lustwerk is now living in Lincoln, Mass. Dr. Robert B. Norris is now a resident of Freehold, N.J. Lieutenant Colonel George H. Sickels, Jr., has been transferred from Colorado Springs to Bossier City, La.

It's still too early in most parts of the country for boat painting or golf. Best wishes from your secretaries for good reading. — J. J. QUINN, ED EDMUNDS, BOB KEATING, and LOU ROSENBLUM, Photon, Inc., Cambridge 41, Mass.

1945

As these notes are written, Greater New York is without local newspapers and the ground is covered with snow as we all make the last minute preparations for the holiday season. I sincerely hope your Christmas season was as merry and happy a one as we anticipate ours will be.

I have just thumbed through the latest Directory of the Alumni Association and submit the following as active workers; should I have missed anyone, please let me know. Alumni Council representative is Bill McKay; associates of the Council are Dave Flood and Dave Trageser. Club officers include Thornton Smith, Treasurer of New York Club, and Ed Stoltz, Treasurer in Western Pennsylvania. Educational Council members are: Julian Davidson, Little Rock, Ark.; Vince Butler, San Francisco; Tom Hewson, Pensacola, Fla.; Dave Flood, Natick, Mass.; Warren Miller, Buffalo; Tom Stephenson, Ed Stoltz, and Al Oxenham, Pittsburgh; and Kirk Drumheller, Richland, Wash.

Robert H. Symonette was recently elected deputy speaker of the House of Assembly in Nassau, Bahamas. Bob, now in his second term in the House, is the junior member for Exuma. Since the appointment was made in late June, naturally Bob, our only active ocean sailor, was absent on a cruise.

As these notes are being written Prexy Dave Trageser is winging his way back from an 18-day European sales trip in behalf of High Voltage Engineering; I trust Mary and the kids have been recipients of foreign Christmas gifts! Dave spent a week in Germany including Berlin, three days each in Copenhagen and Italy, plus four days in London. Russ Hamon presented a paper on "An Analysis of the Agricultural Drought in Connecticut during 1957" at the second national conference on agricultural meteorology held in conjunction with the 170th meeting of the American Meteorological Society last October in New Haven, Conn.

Jerry and Lib Patterson proudly announced the birth of their fourth child, first daughter, Elizabeth Lee, on October 30. Since their youngest son is in kindergarten, I know proud father has been experiencing difficulty rejoining the diaper brigade! Tom and Jimmie Stephenson have moved from Mt. Lebanon to New Kensington, Pa.; if the house displayed in their block print change of address card is indicative of their home, all I can say is what a mansion!

I enjoyed talking with Don Lovell of Greenwich, Conn., at the November meeting of the local M.I.T. Club. The latest Alumni Register indicates Don was a project engineer with Electronics Corp. of America in Cambridge in 1955. Since that time Don has been with Barnes En-

gineering here in Stamford; he is now associated with Spectra Electronics Corp., a division of Douglas Microwave Co., Inc., in Mount Vernon, N.Y. We recently indicated Slim Pasfield was teaching at Trinity College in Hartford; a recent address change has Slim located in Sayville, N.Y., out on Long Island. What a commutation; our original information must have been in error! Bill Niedhamer has moved from Orlando, Fla., across the country to Covina, Calif., while Mal Crowther has gone south from Ohio to Kansas City. Marshall Byer has moved all of 60 miles from Painted Post to Vestal, N.Y. Another "rebel" is T. Nicolas Berlage who has joined Minneapolis-Honeywell's staff in St. Petersburg after several years in Minneapolis.

George K. Turner of G. K. Turner Associates of Palo Alto, Calif., makers of medical and technical instruments, recently announced the development of a new fluorometer of extreme sensitivity ranging to as low as 5×10^{-4} micrograms of quinine sulphate. Chuck and Jeff Buik moved from Rochester, N.Y., to Burlington, Vt., last July. As Chuck aptly puts it, he took a real deep plunge in taking over the Champlain Paper Box Company in Burlington, manufacturers, at present, of corrugated containers and set up and folding boxes. Chuck indicates owning one's business has a lot of merit with more than one's share of headaches. I know you all join me in wishing the Buiks success; I also know many of us jealously wish we were a part of this area which might be called a sportsman's paradise.

I hope there is some mail from you folks during this Christmas season so that we can rejoin you next month. — C. H. SPRINGER, *Secretary*, 420 Lexington Avenue, New York 17, N.Y.

1946

The 1958-59 M.I.T. Alumni Association Directory has just been published and mentions the names of many classmates active in Alumni activities. A fast pass through the 48 pages turns up the following names, and I apologize to those whose names I missed. Your class officers are, for those who may have forgotten: Herbert J. Hansell, 1759 Union Commerce Building, Cleveland 14, Ohio, President; Donald A. Hurter, 40 Fisher Street, Norwood, Mass., Vice-president; Edwin H. Tebbetts, 100 Memorial Drive, Cambridge 42, Mass., Treasurer; Howard Perlmutter, Menninger Foundation, Division of Industrial Mental Health, Topeka, Kansas, Class Agent; and Yours Truly, Secretary. Our class representative on the Alumni Council is Don Hurter.

Active in M.I.T. clubs throughout the world are the following: William H. Schield, Jr., 2723 East Newton Avenue, Vice-president of the Milwaukee club; Pablo J. More, Avda. Brasil 2865, P-4, Secretary-Treasurer of the Montevideo, Uruguay, club; Richard G. Steuer, 30 Jamaica Avenue, Hicksville, Long Island, Secretary of the M.I.T. Alumni of Long Island; Colin A. Roberts, 50 Clarke Road, Barrington, Secretary-Treasurer of the Providence, R.I., club; David M. Denzer, Lake Hill Road, Burnt Hills, N.Y., Secretary of the Schenectady club; and Chih C. Tai, Taiwan Power Co., 39 East Huo-Ping Road, Taipei, Taiwan, Secretary of his club. Working for the M.I.T. Educational Council are: Philip L. Caron, 2501 Kenway Drive, Des Moines, Iowa; Walter A. Backofen, 2 Lee Street, Marblehead, Mass.; John E. Taylor, Room 304, 511 Locust Street, St. Louis, Mo.; John E. Warren, 148 Fairway Avenue, Belleville, N.J.; William C. Freeman, Combustion Engineering Inc., 200 Madison Avenue, New York City; Robert F. Lathlaen, W. J. Barney Corp., 101 Park Avenue, New York City; Alexander E. Halberstadt, Jr., 515 Bastogne Drive, Akron, Ohio; David F. Moyer, 94 Patterson Road, Dayton, Ohio; Gerome Gordon, Swindell-Dressler Corp., Pittsburgh, Pa.; Arnold G. Gangnes, 2414 51st St. Southwest, Seattle, Wash.; Antonio Carlos Marinho Nunes, Rua Paulo Cezar de Andrade 106, Apartment 604, Rio de Janeiro; and Jose M. Bosch-Aymerich, Paseo de Gracia 30, Barcelona, Spain.

Jan and I were honored to attend a cocktail party a few weeks ago, thrown by Ned and Priscilla Tebbetts to celebrate their homecoming from a belated honeymoon trip to Europe. The Ted Heuchlings and the Don Hurters were there also, and a fine time was had by all. A news release just received mentions a new appointee to the M.I.T. Educational Council. George Bott, of 17 Warnock Drive, Westport, Conn., was named too late to get his name in the new Directory. George is senior operations research analyst for the Central Research Laboratory of the American Machine and Foundry Co. He is also a member of the Operations Research Society of America, a member of the Institute of Management Science, and is admissions committee secretary of the Southwestern Connecticut branch of the Scientific Research Society of America.

Alan R. Gruber has recently moved to California with his wife and three children to take a new job with Marquardt Aircraft Co., Van Nuys, Calif., as assistant chief engineer for Nuclear Research. The Grubers now make their home at 23704 Long Valley Road, Calabasas, Calif. Hector McVey was in the Chilean Navy while at M.I.T. and after graduation he had a year's tour of training duty at Norfolk Naval Shipyard. He then went back to Chile in 1947 and served with the Chilean Navy until retiring in 1950. He worked for three years in a steel mill in Chile, and then returned to the U.S. to work for the J. J. Henry Co., Inc., Naval architects, marine engineers, and marine surveyors. He is new chief engineer of their Philadelphia office. Hector is married, has three boys and two girls all born in Chile, and they now live at 28 Long Lane, Malvern, Pa.

Hasmukh P. Oza is employed by the state of Bombay in the Republic of India as principal port officer and engineer in charge of the ports of the state. He has been engaged in the preparation of designs for the various minor ports of the state. He received his S.M. from M.I.T. and his M.S. from Bombay University. Hasmukh has two sons and three daughters and lives at Dhrol House, near Jam Tower, Rajkot, Bombay State, India. He is an associate of the Institute of Marine Engineers, London, and an associate member of the Institute of Engineers, India. Oscar Luis Briozzo, until 1954, was an assistant professor of electrical engineering at the Buenos Aires (Argentina) University. He then joined the Compania Argentina de Electricidad and is now their chief engineer. He is married, has three children, and makes his home at Laprida 526, San Isidro, F.C.M.G. B.M., Buenos Aires, Argentina. Robert A. Summers earned his S.M. from M.I.T. in 1946, in 1952 had an M.I.T. Overseas Summer Fellowship at the Royal Institute of Technology, Stockholm, Sweden, and then received his Sc.D. from M.I.T. in 1954. He is now chief project engineer, Systems Engineering Division of Allied Research Associates, Inc., Boston. Bob makes his home at 100 Memorial Drive, Cambridge. Arnold G. Gangnes has his own architectural firm in Seattle. His business includes the designing of residential dwellings, medical clinics, office buildings, churches, and training and treatment centers for handicapped children. His most recent assignments have been the Retarded Children's Training Center, Seattle, and the Residential Treatment Center for Emotionally Disturbed Children for Washington State. He is a director of the Washington State chapter of the American Institute of Architects, a director of the National Association for Retarded Children, and a director of the Washington Association for Retarded Children. Arnold has four children.

Robert F. Nelson, Jr., is now employed as an electrical engineer with the Product Improvement Engineering Department of the Raytheon Manufacturing Co., Wayland, Mass. He is working on the battery control center and pulse acquisition radar of the Army's Hawk Missile System in an effort to cut costs and speed production. Bob is married, has two children, and has recently completed building his new home at South Main Street, Sherborn, Mass. He lives near Dave Hoag, and has apparently inspired him because he reports that Dave is in the midst of building a two-storied garage. J. Charles Ajemian is a senior structures engineer at the Sikorsky Aircraft Division of United Aircraft Corp. He recently earned his master's degree in Engineering Mechanics under the United Aircraft Fellowship Program at Yale University. He resides at 120 Clarkson Street, Bridgeport, Conn. E. Sumner Draper, Jr., is now connected with the firm of Graves and Toy, architects, in Charlotte, N.C., and lives on Town and Country Road, Charlotte. Harvey Freeman is president of the Independent Engineering Co., 17408 Wyoming, Detroit, Mich. A recent clipping from the *Detroit Times* shows a picture of him being fired at by policemen sporting .45 automatics, .38 revolvers and .45-gauge shotguns. Fortunately for Harvey he was wearing a bullet-proof suit of his own design made of "indearm," an alloy of plastic and fiberglas. The police were quite impressed and ordered four such suits for their arsenal. Harvey is using "indearm" to develop classified projects for Army Ordnance. The Freemans and three children live at 29553 Lochmoor, Farmington Township, Mich.

You are all invited to take aim at me, but please restrict your fire to letters and

post cards — at least until Harvey fills my order for a bullet-proof suit. — JOHN A. MAYNARD, *Secretary*, 15 Cabot Street, Winchester, Mass.

1948

In spite of the Maine winter, our sources of information managed to establish postal communications with the little hamlet of Hebron. Here are the items of interest they sent to us.

In West Newton, early in November, Miss Susan Richmond of Newton became the bride of Mr. L. Allen Levenson of Haverhill. Mrs. Levenson is a graduate of Simmons College and attended the Boston Museum School of Fine Arts. The couple will live on Maple Avenue, Haverhill. Our very best wishes go to Mr. and Mrs. Al Levenson.

Under the general heading of promotions we can cite Ronald J. R. Kallman's appointment to the newly created position of western regional manager for Transac computer systems by Philco Corporation's Government and Industrial Division. Ron will make his headquarters at Philco's Western Division Laboratory, Palo Alto, Calif. Also, Captain Ployer P. Hill, United States Air Force, has been assigned as project officer in the inertial section of the Guidance Branch at the Ballistic Missiles Center of Air Materiel Command in Inglewood, Calif. Captain Hill's work with inertial guidance systems will involve him in such newsworthy projects as Atlas, Titan, Thor, Minuteman, the Thor-Able nosecone, and the lunar test vehicle. Captain Hill and family live at 28324 Pontecorvo Drive, Rolling Hills, Calif.

Dr. Armand Feigenbaum of the General Electric Company was the first conference speaker at the St. Louis conference of the American Society for Quality Control last October. The title of his speech was "Total Quality Control." Dr. Malcolm W. P. Strandberg was featured in a news item about M.I.T. in the October issue of *Electrical Engineering*. The article had to do with the grant to the Institute by the National Association of Music Merchants. He is one of three supervisors of research, the others being Tech men also: Dr. Melville Clark, Jr.,'43, and Dr. William M. Siebert'46. Morton B. Braun discussed the physical planning and procedural aspects of the problem of urban renewal and redevelopment at a meeting in November of the Melrose community council. Mr. Braun is a partner in Planning and Renewal Associates, Cambridge firm of professional city planners. He has also held planning positions in the Providence Redevelopment Agency, the U.S. Housing and Home Finance Agency, and the Massachusetts State Housing Board.

We have also been represented recently in the field of amateur theatricals. George Fountas was the producer of the play *Mousetraps*, which was put on by the players of the Second Congregational Church of Attleboro on November 6 and 7. We trust the performance was successful to the point that people are now beating a path to George's door. He is also active with the Boy Scout troop and teaches seventh grade in the Sunday School.

We are writing these words just before Christmas, 1958, and the greeting will be late; but our best wishes go out to all of you for a happy holiday season and a successful New Year. — ROBERT R. MOTT. — RICHARD H. HARRIS, *Secretary*, 26 South Street, Grafton, Mass. HARRY G. JONES, *Assistant Secretary*, 94 Oregon Avenue, Bronxville 8, N.Y. HERBERT S. KINDLER, *Assistant Secretary*, 128 Elatan Drive, Pittsburgh 16, Pa. ROBERT R. MOTT, *Assistant Secretary*, Box 113, Hebron, Maine.

1950

I sometimes forget that a great many of our classmates are employed in foreign lands. The first section of class news this month will be dedicated to the "foreign service."

A. J. Fuller writes from Toronto, where he is general manager of Rainbow Plastics, Limited: "My wife Lynn and I now have three sons — Christopher and Mark, five and four, and Michael, born June 4, 1958." Concerning our Class President's contribution to Canadian-American relations, he continues: "Incidentally, I wonder if we should chalk up one black mark against Bob Mann for sending out two-cent postal cards with United States postal card stamps on them to class members in foreign regions. Somehow or other, I don't think the Canadian post office would be too happy if we mailed back these cards without putting a Canadian stamp on them."

Martin Goodwin, who received his S.M. degree in 1950, Course XVII, passes the word that in September he is going to start to travel in Europe for a year with his family, taking that time out from his consulting and construction activities. Guy Viellet reported from Neuilly sur Seine, France, the arrival of a girl, Sylne, last April. Their boy Jerome is now two years old. He's still working in the tungsten carbide tools business . . . getting interested in the ceramics field.

Dick Davies, one of the new "foreign" regional secretaries, sent along this little note: "Since I volunteered (?) for this job, I have been moved to Montreal. However, letters to either Niagara Falls or Cyanamid of Canada, 2055 Peel Street, Montreal, will reach me. Five in the family (Dick, seven; Bob, six; and Will, three) make moving even more interesting."

And from Zurich, Switzerland, word from Maurice Kunstenaar: "After leaving Tech in 1950, I joined the Sydney Ross Company, Newark, N.J., where I was being trained for production manager in one of their Latin American plants. The training was suspended after about two months because of the Korean War. In effect, the company had many difficulties with their employees sent abroad from the United States during the second world war because many had to be called back for active duty, and they were afraid that the same thing would happen to me. Then I took a position as chemical engineer with Merck and Company, Rahway, N.J. I worked in the development section, mostly on cortisone, for a year, and was then transferred to their export department in New York City with a view of being trained to be sent abroad to head one of the assembling operations which they were planning to initiate.

"Since no progress was being made in respect to the assembling operations envisaged, and also for other reasons, I left one and a half years after and went to Europe for about three months. Upon returning I joined the Hilliard Corporation in Elmira, N.Y., as manager in the Export Division to organize an export department for them. This resulted in my traveling to Latin America and Europe. In the meantime, I married Miss Adriana Salinas in 1954 and became the proud father of a nine-pound five-ounce 22-inch baby boy, Jean-Pierre, in 1956. Last year it was decided to open a European branch for the above firm, and I came to Zurich, Switzerland, in November as director of European Operations. The office is still being organized and, in addition, I travel continuously throughout Europe. Hard — but most interesting — work is involved, and I am getting to know Europe like few people do. This brings me to the present, and I will be glad to write again when something of interest (like another birth in the family) comes up."

Mariano Romaguera, our foreign secretary from South America, reports the following: "Harry Falcao has been working for Esso Standard of Brazil since graduation. He is presently the Rio de Janeiro district manager. Harry married Maria Cristina in July, 1954, and so far they have three children — Octavio, three years; Veronica, two years; and Susana, almost one year old. Gustavo Gross is working in Ecuador as manager of the Guayaquil Telephone Company. He has spent time in Sweden working on arrangements with the L. M. Ericsson Company related to the new telephone expansion program. In May of 1954 he was married to Carmela Barriga." Nana, Romaguera himself, has been working in Colombia, South America, with the sugar refinery industry. He has been busy designing and constructing bigger and better refineries for the Colombian sugar cane crop. He and Virginia have three little ones — four years, two years, and six months — to keep them busy in the evenings. They are starting to think about visiting here for our 10th reunion, and all of a sudden I realize that this time next year we will be accepting reservations for our 10th reunion. It's later than you think!

The following news has been gathered by Ed Cohen, 625 North Broad Street, Elizabeth, N.J.: "Bob and Jinny Michel now have three children — Dick, five years; Ann, three years; and Susan, one year old. Bob is working at the Kraissl Company, Inc., in Hackensack, N.J. This company manufactures pumps and strainers. Ed Hollister was married last May and is now living in Roselle Park, N.J. Fred Adams is working as a project architect with the firm of Felcheimer and Wagner, New York City; and he recently became a member of the American Institute of Architects.

"Nort Belknap is now with Standard Oil Company in New Jersey and is currently the head of the analysis section of the Co-ordination and Petroleum Economics Department. Nort and Mary have two children — Paula, three years, and

Barry, one year old. Nort was fortunate enough to spend several weeks in Europe during the early part of this year on company business. He claims it was all business, but I think that he managed to have a pretty good time in Paris. Ed Kruse is still with Esso Research and Engineering. In fact, he and I work in the same section. He has managed to stay single all these years and lives in Chatham." Ed writes further: "As for myself, I finally severed all connections (except for fond memories) with Tech last summer when I resigned from the Faculty. I am now with Esso Research and delighted with my job. I am still single, too."

It is with regret that I have to relay the news of Stanley Korylak. Stan had been employed as an engineer with the guided missile division of Lockheed Aircraft in Los Angeles since graduation. On October 21, 1958, he passed away after a long illness.

Before signing off for this month, I'd like to make a plea for two envelopes: one containing news for this column to be addressed to your regional secretary or myself, and the other containing a check and addressed to the Alumni Fund. — JOHN T. WEAVER, *Secretary*, 24 Notre Dame Road, Bedford, Mass.

1953

Will start off the month's news with a note from Ted (Kaltman) Bodner and his wife, Joan. He has managed to fill in the last five years with three years of service in the Coast Guard and now is in the middle of his third year as a medical student at the New York University College of Medicine. Ted and Joan were married in 1954 and have two children, a son one and one-half years old and a daughter two months old. Jon and Virginia Van Winkle proudly announced the arrival of a son on the 4th of November. They are living in Schenectady, where Jon works for General Electric.

I do suppose the biggest news of the month — from where I sit — is the announcement of the December marriage of Yours Truly (Marty Wohl) to Ann Findley, who is a native of Cleveland and a graduate of Middlebury College. The wedding will take place at the M.I.T. Chapel. (The only dreadful feature of the whole business is that I won't be eligible for the "oldest unengaged bachelor" award at the next reunion!) At any rate, stay tuned to this column and find out next month if the future tense becomes past. (No bets, please.)

To my surprise, Fred Cronin dropped by the office. At the present time, he and his wife are living in Silver Spring, Md.; they have a one-year-old son and are expecting another child in January. Then in February he will finish his two-year duty with the Army (stationed at Fort Meade right now); fortunately, he has spent most of his time supervising computer projects. Prior to his service duty, Fred did graduate study at Tech and received both his S.M. and E.E. degrees.

Word just arrived from Harry Krimbill's wife, Jane, (don't you husbands ever write????) bringing us up to date on their life. Harry left Dow Chemical Company in Michigan this October and sauntered down to St. Peterburg, Fla.; he is working for the Houston Texas Oil and Gas Company, which is laying a pipeline from Texas to Florida to bring in and distribute the first natural gas to Florida. To quote Jane: "Moving to St. Petersburg is quite delightful: we go swimming every week end. Our family has increased to two boys, Mike and Steve, and a little girl, Patti. If ever in Florida, we'd love to see Harry's 'old buddies.'"

Ed Colbeth and Carol Stickle (a graduate of Sargent College) were married on October 25 here in the Boston area (Needham). Following a wedding trip in New Hampshire, they returned to Baltimore, where Ed is working. A short note from John and Ann Kaufman brought news of a daughter born in November. At the present time he is assistant to the vice-president of Campus Sweater and Sportswear Co. and stationed in the New York office. James Wynne apparently is doing big things in marine power package design. He designed a new power unit (known as Volvo Aquamatic) that is said to "combine all the advantages of the inboard engine and outboard drive," and at the same time reduces fuel cost by about one-third.

Good ole Fred Zwerling! He and Ellie have added "the one child (on the way) and one dog" as prophesied in the June issue of Tech Review. Also, it seems that his company, Triangle Sheet Metal Works in New Hyde Park, Long Island, is looking for "men experienced in heating, ventilating, and air conditioning work . . . primarily men who are interested in contracting work rather than in design." If any of you are interested, contact Fred at 115 New Hyde Park Road, or drop me a line. — MARTIN WOHL, *Secretary, Apartment* 8-18C, 100 Memorial Drive, Cambridge 42, Mass.

1954

With our reunion only four months away, it seems appropriate to pass on the latest word from Bob Anslow concerning that affair. The dates, as mentioned previously, are June 13 and June 14. Try to plan vacations or business trips to Boston so that you can be with us for the festivities. The plans at present call for a 24-hour celebration, from Saturday afternoon, June 13, to Sunday afternoon. An informal get-together Friday night is also a good possibility. Wives and girl friends are most welcome. As this is being written, in December, we don't have the final word on the location; but by the time you read this column, you may have received a letter from Bob naming the spot. In any event, the location will be made known in the near future; it will be in the Boston area. The members of the reunion committee, by the way, include — in addition to Bob Anslow — Wally Boquist, Bruce Brosler, Charley Burnham, Larry Holmes, Ron McKay, George Perry, Bob Reichard, Tony Turano, and Klaus Zwilsky. Anyone else who would like to help will be welcomed joyfully; drop a line to Bob Anslow at 935 Massachusetts Avenue, Lexington 73, Mass.

Class news is somewhat at a premium these days. Ron and Sally McKay report the birth of son, Kenneth Bruce, on October 17. Bob Warshawer and his wife send word that daughter Marcy Ellen arrived on August 26. Bob is now working in the Prototype Department of Avco Research and Development Company in Wilmington, Mass.

Several weddings have been brought to light recently. Bob Schultz married Suzanne Bergeron at Champaign, Ill., on August 23. Bruce Williams and Elizabeth Sausmon strolled down the aisle in Jackson, Calif., on September 20. John Duffin and Therese Rosauer were wed in October in Los Angeles. And the marriage bug has finally gotten around to ye olde class officers. Usually reliable sources report that Dean Jacoby is engaged to Judy Haywood with the wedding scheduled for June. Not to be outdone, your weary Secretary has gotten himself engaged to Marcia Duffy, of Denver, N.Y., and St. Louis. I should be married by reunion time.

The column is rather short this month, due chiefly to a scarcity of material. How about dropping a line this way with some juicy gossip for your classmates to chew? — EDWIN G. EIGEL, JR., *Secretary*, 3654 Flora Place, St. Louis 10, Mo.

1955

Some news at last! Apologies for the months, like last, when you turn to the back only to find nothing for 1955; but quite literally there is sometimes *no* news. However, things are now looking up. I notice in the recently published Directory for the Alumni Association that Harry Schreiber, back at Tech for a master's degree, is our class representative on the Alumni Council for 1958-59. I searched in vain for the names of members of our Class who are officers of M.I.T. clubs or are serving the Institute as Alumni in other capacities, but it was rather like looking for a needle in a haystack!

Congratulations are due to the Dave Brookses, who welcomed a new daughter, Naomi Sara, on November 16. Site of the event, Boulder, Colo. Also congratulations to a number of recently married and soon-to-be-married members of the Class. Walt Rubin and Naomi Meltzer of Worcester have issued invitations for December 28 to their wedding. Walt is in New York City in his final year at the Cornell Medical School. Back in September Leonard Salvador was married to Marion Ann Bakos of South Hadley, an alumna of the Holyoke Business School. Leonard, recently discharged from the Air Force, is studying city and regional planning at the Harvard Graduate School; so the Salvadors have settled down to life in Cambridge after a honeymoon in Bermuda. In October Bob Grout married a fellow worker at the Eastman Kodak Company, Joan Margaret Spence of Rochester. The Grouts traveled to Washington, D.C., and Virginia and are now living in Rochester. A motor trip to the West followed the wedding of Richard Varney to Deborah Farnum of Auburn, an alumna of Lasell Junior College. Richard is sales manager of Varney Brothers Sand and Gravel Co., Inc., in Bellingham, and the couple will be living in Mendon. Henry and Joan Wheeler du Pont, who were wed in late October, are living in

Easton, Conn. Joan, a native of Easton, is an alumna of the Grace New Haven Hospital School of X-Ray Technology. Hank is with the Remington Arms Company in Bridgeport.

A summer wedding that we just received word of was that of Stu Peltz'56 to Ginny Rudnick. This item was one of many in a great letter from Les Lee, who is giving some thought to the fact that he'll soon be the only Alpha Epsilon Pi bachelor left in our Class! Les is back at Fort McClellan after some exciting adventures in Bikini and Nevada in radiological safety operations earlier in the year. He did quite a lot of traveling, and he most strongly recommends Hawaii, having spent some time exploring that "paradise." Les will be leaving the Army and Fort McClellan in a few months more, leaving behind him in that chemical outpost of Dixie only Carl Hess and his growing family, so far as members of our Class are concerned.

One last item, a very sad note — John Bolman was killed in Andover in September in an auto accident. Our sympathy to his family. Do let me hear from you! — MRS. J. H. VENARDE, *Secretary,* 107 Mullin Road, Wilmington 3, Del. FIRST LIEUTENANT LABAN DENNIS SHAPIRO, *Assistant Secretary,* 15 Linnaean Street, Cambridge 38, Mass.

1956

On this first opportunity, let us extend our congratulations to Tech's new president and commend him on his fine annual report. It is good to see that in this time of need the Corporation recognizes it is best not to have a temporary administration.

Just received is a note from Mrs. Lewis W. Dunham, Jr., of Indianapolis informing us that her husband died of heart disease on December 1. Lewis was a resident of Baker House while at Tech and was active in WMIT and the American Institute of Electrical Engineers. Since graduation Lewis has attended the Indiana University School of Medicine where he entered his third year this fall. We extend our deepest sympathy to Mrs. Dunham.

Late last summer another tragedy befell one of our classmates. George Luthringer's fiancée, Sarah Striebeck, died after a short illness. Sarah had graduated with honors from Smith College in June. Our deepest sympathy to George.

Donald Barnby has received his master's from Tech and is now with the 178th Signal Company, Fort Sam Houston, Texas. David Wheeler is in the 11th Air Division in Alaska.

Fred Bialek is with Kennecott Copper Corp. in Hayden, Ariz. Joe Huber participated in a paper on Space Antenna for Interplanetary Guidance Systems presented at the University of Illinois Air Force Electronic Antenna Conference. Joe dropped in for a short visit a few weeks ago. William Keating is at the Instrumentation Laboratory at Tech. Garry Quinn has moved from D.C. to Hanford, Wash., to work for the Atomic Energy Commission for a year and reports it a very desolate area. Thomas Yonker is with AiResearch Manufacturing Co. of Phoenix, Ariz.

Jewell Bowen, Paul Brown, and Terrance Carney received their master's from Tech. Fred Culick has been in Glasgow on a Fulbright and plans to return to Tech for his doctorate.

A retraction is in order for John Reynders whose wedding, as mentioned in the November, 1958, issue, did not take place.

John Hartigan became engaged to Virginia Newton of West Roxbury last fall and is attending the Columbia Graduate School of Business. Nancy Vinsonhaler became Mrs. Frank Shilling Eby last summer. Mr. Eby is a coworker in the University of California Radiation Laboratory in Berkeley. The wedding trip was along the Northwest coast to Canada. Stanley Wray became engaged last fall to Marie Marguerite Max (a Tech coed) of Cambridge.

Mort and Jacquie Allen announce the birth of a daughter, Jody Elizabeth, on June 25, 1958.

Wolf Vieth received his M.S. from Ohio State in 1958 and is now working on his doctorate. He and his wife were married on July 6, 1957. Last summer he worked in the Du Pont Mylar plant at Circleville, Ohio.

Ritner Walling works for Oliver Transportation Co. in Philadelphia. Ritner was involved in a mountain climbing tragedy at Mount Saint Elias, Alaska, in July 1958, and helped rescue the survivors.

Incidentals: Bernhard Romberg has a brother Edgar in the Class of '62. Excerpts from club notes in the November '58 Review find Michael Parker attending meetings of the Atlanta Club and Ed Zoolalian at the Tokyo Club.

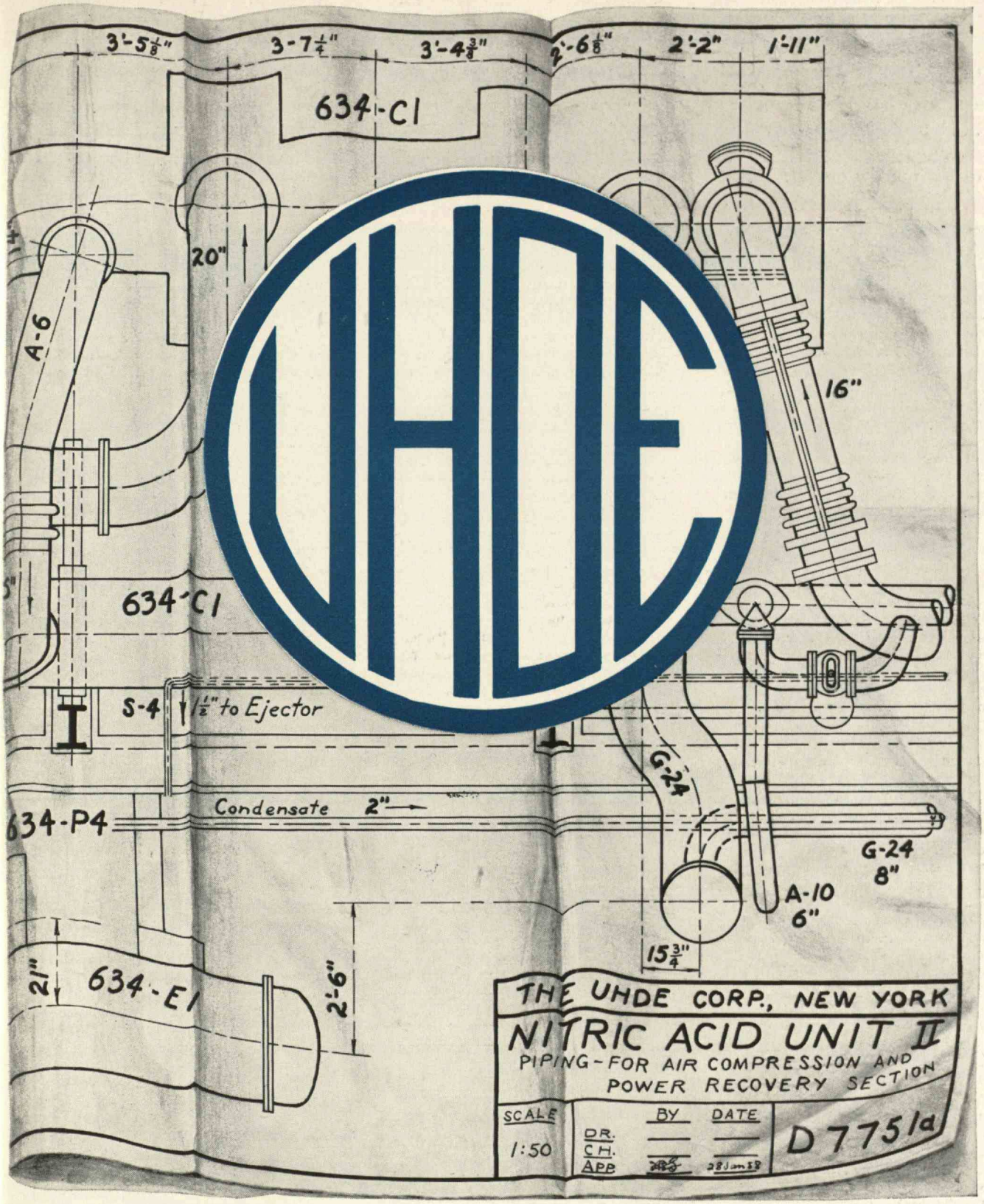
Jack Saloma worked last summer for the International Co-operation Administration on Point Four evaluation and returned to Harvard this fall. Jack, via Phil Bryden, helped provide information for this article. Phil, meanwhile, reports that he is teaching two courses in addition to working on his psychology doctorate. One course is for student nurses. (Gad, since when were the ivy covered walls like this?) — BRUCE B. BREDEHOFT, *Secretary,* 1528 Dial Court, Springfield, Ill. M. PHILIP BRYDEN, *Assistant Secretary,* 3684 McTavish Street, Montreal, P.Q., Canada.

1957

The matrimonial messages of several of our colleagues have recently reached us, although these happy events occurred a few months before the turn of the new year. August 16 saw the double ring ceremony unite Elizabeth Rodden and Robert Smart. Bob is presently an ensign stationed in California. On the last day of August, the wedding of Enid Diane Baker and Michael Mintz took place. On September 6, Ronald Enstrom took as his bride Daly Hirsch, the former Miss Massachusetts. After a wedding trip to New York they returned to Boston, where they set up home on Beacon Hill. During the same afternoon, John Penhune and Nancy Peabody were married in Brookline. They returned to Boston, where John is doing graduate work at Tech while his wife completes her studies at Simmons. Bill Brandon and his bride, the former Ann Gustafson, took their marriage vows on September 13. Bill is now working for Raytheon, while his wife completes her senior year at Wellesley. Toward the end of September, Ralph Brown and Barbara Forman were married. After the ceremony, the couple journeyed to Nantucket and thence to Ann Arbor, where Ralph is doing graduate work at the University of Michigan. On October 11, Elizabeth Aimetti became the bride of Paul Wood. Later that afternoon, they drove off on an autumn journey through Canada.

Merrill Ginsburg is working on his Ph.D. at the University of Utah, where he has been awarded a Pan American Petroleum Foundation fellowship in geophysics. He will conduct research either in the field of seismology or gravity, preparatory to a planned career in oil exploration. Phil Pluta received a master of science degree in engineering at the University of Michigan, where his investigations were concerned with atomic energy. John Brown, Jr., has accepted a position as physics and mathematics teacher in York, Pa. It would seem that John has had a resurgence of pedagogical enthusiasm since he and your writer escaped a pair of neurotic disasters after attempting to instruct several young patients at the Metropolitan State Mental Hospital in the wonders of science. Dick Williamson, after six months in the Officers' Club at Fort Monmouth, has returned to his project at Instrumentation Laboratory of M.I.T.

That we of the Class of '57 have not discovered the secret of eternal youth is brought home by a recent bit of news. Not that any among us has applied for an old age pension, nor have any of our children yet been admitted to the Institute; however, seven younger brothers have become members of the Class of '62. They are Robert Brady, Wallace Ching, Roger Gerstenfeld, David and William Koch, Bardwell Salmon, and Juri Toomre, whose respective fraternal relations are Bill Brady, Frank Ching, Sam Gerstenfeld, Charles Koch, Bill Salmon, and Alar Toomre. — ALAN M. MAY, *Secretary,* 55 East End Avenue, New York 28, N.Y. MARTIN R. FORSBERG, *Assistant Secretary,* 383 Harvard Street, Cambridge 38, Mass.



CHEMICAL PROCESS DESIGN

THE *UHDE CORPORATION*

350 FIFTH AVENUE, NEW YORK 1, N.Y.

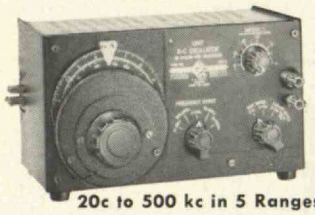
8204 Empire State Building

UNIT OSCILLATORS

for every application

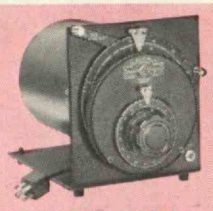
... coverage from 20 cycles to 7400 megacycles.

- ★ High power output.
- ★ Small size conserves bench space.
- ★ Good stability — comparable to much more expensive generators — widely used in applications where stability is of the essence.
- ★ Simple, inexpensive fixed-frequency Oscillators available for modulating HF, VHF, and UHF units.
- ★ Convert to sweep oscillators with G-R Dial Drives.
- ★ Simple, ingenious design makes for high quality at low cost.
- ★ Used in critical defense applications, including missile work and radar warning systems.



20c to 500 kc in 5 Ranges

Type 1210-C Unit R-C Oscillator, $180 . . . accuracy ± 3% . . . three outputs: either low-impedance sine wave (80mw), high-impedance sine wave (40mw), or square wave (0-30v p-p)



0.5 to 50 Mc in 2 Ranges

Type 1211-B Unit Oscillator, $275 . . . accuracy ± 2% . . . power output into 50-ohm load: 1500 mw (0.5 to 5 Mc), and 500 mw (5-50 Mc).

Type 1215-B Unit Oscillator, $190 . . . accuracy ± 1% . . . minimum 100-mw output into 50-ohm load; 200 mw over most of range.

Type 1208-B Unit Oscillator, $210 . . . accuracy ± 2% . . . 200-mw output into 50 ohms; 400 mw over most of range.

180 to 600 Mc

Type 1209-BL Unit Oscillator, $245 . . . accuracy ± 1% . . . 300-mw output into 50 ohms; 400 mw over most of range.

250-920 Mc

Type 1209-B Unit Oscillator, $245 . . . accuracy ± 1% . . . 200-mw output into 50 ohms; 300 mw over most of range.

900-2000 Mc

Type 1218-A Unit Oscillator, $465 . . . accuracy ± 1% . . . 200-mw output into 50 ohms.

2700 to 7400 Mc, Depending on Klystron Used

Type 1220-A Unit Klystron Oscillator, $215 (less klystron) . . . 75- to 100-mw nominal output (depending on klystron).

POWER SUPPLIES FOR UNIT OSCILLATORS

Type 1201-B Unit Regulated Power Supply . . . $85 similar to 1203-B but with regulated plate supply. Unit oscillator output power is reduced 30-50% when Regulated Supply is used.

Type 1203-B Unit Power Supply . . . $40

6.3v ac at 3 amps; 300v dc at 50 ma

DIAL DRIVES ADAPT OSCILLATORS TO AUTOMATIC-SWEEP APPLICATIONS

Type 908-P Synchronous Dial Drives . . . $29 ea. attach to all Unit Oscillators except 1220-A Klystron Oscillators and 1214 Fixed-Frequency Oscillators . . . 4-rpm 908-P1 model for use with graphic recorders, 30-rpm -P2 model for use with scopes.

Type 907-R and 908-R Dial Drives . . . $55 ea. Similar to 908-P but provide a sweep voltage proportional to shaft position for use with x-y plotters . . . 4 models available with ½- or 4-rpm pinion speed (18°/min and 144°/min for G-R 907 dials used on 1208, 1209, and 1210 oscillators; 12°/min and 96° min for G-R 908 dials used on 1211, 1215 and 1218 oscillators).

1214 SERIES FIXED-FREQUENCY OSCILLATORS FOR BRIDGE MEASUREMENTS

TYPE NO.	FREQUENCY	ACCURACY	OUTPUT	PRICE
1214-A	1000c 400c	±2%	200 mw	$ 75
1214-D	120c	±2%	200 mw	$100
1214-E	1000c 270c	±2%	200 mw	$ 75
1214-M	1Mc	±1%	300 mw	$ 75

All 1214 Oscillators have built-in power supplies

To Construct Systems for Complex Measurements Work . . .

. . . a wide variety of amplifiers, calibrators, detectors, pulsers, and vhf-uhf coaxial components including attenuators, filters, and mixers are available for use with Unit Oscillators.

Write for Complete Information

GENERAL RADIO COMPANY

275 MASSACHUSETTS AVENUE, CAMBRIDGE 39, MASSACHUSETTS

NEW YORK AREA
Broad Ave. at Linden
Ridgefield, N. J.
N. Y. WOrth 4-2722
N. J. WHitney 3-3140

CHICAGO
6605 W. North Ave.
Oak Park Ill.
VIllage 8-9400

PHILADELPHIA
1150 York Rd.
Abington, Pa.
HAncock 4-7419

WASHINGTON, D.C.
8055 Thirteenth St.
Silver Spring, Md.
JUniper 5-1088

SAN FRANCISCO
1182 Los Altos Ave.
Los Altos, Cal.
WHitecliff 8-8233

LOS ANGELES
1000 N. Seward St.
Los Angeles 38, Cal.
HOllywood 9-6201

IN CANADA
99 Floral Pkwy.
Toronto 15, Ontario
CHerry 6-2171